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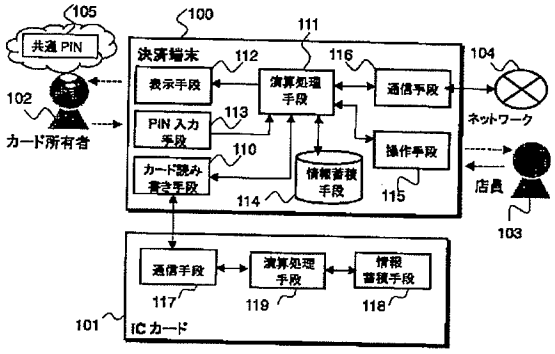
(54)【発明の名称】　ＩＣカード端末および本人認証方法

(57)【要約】
【課題】　個別ＰＩＮ認証を必要とする複数のサービスに対応したＩＣカードを用いるサービスにおいて、共通のＰＩＮを用いて各サービスを享受できるようにする。
【解決手段】　カード所有者１０２の正当性確認が必要なサービスを処理するサービスプログラムが１個以上とカード所有者の正当性確認を行うために用いる個別暗証番号が１個以上と前記個別暗証番号を暗号化した暗号化暗証番号が１個以上記憶されたＩＣカード１０１を用いるＩＣカード端末１００が、第１の暗証番号を入力する暗証番号入力手段１１３と、ＩＣカードと通信を行うカード読み書き手段１１０と、ＩＣカードから読み出した暗号化暗証番号を第１の暗証番号で復号化して第２の暗証番号を生成し、第２の暗証番号をＩＣカードに送信して、ＩＣカード内部で第２の暗証番号が個別暗証番号と一致した場合に、サービスを正常実行する演算処理手段１１１とを備えた。



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【特許請求の範囲】

【請求項１】　カード所有者の正当性確認が必要なサービスを処理するサービスプログラムが１個以上と、前記カード所有者の正当性確認を行うために用いる個別暗証番号が１個以上と、前記個別暗証番号を暗号化した暗号化暗証番号が１個以上記憶されたＩＣカードを用いるＩＣカード端末であって、前記カード所有者が第１の暗証番号の入力を行える暗証番号入力手段と、前記ＩＣカードと通信を行うカード読み書き手段と、前記暗号化暗証番号を前記カード読み書き手段により前記ＩＣカードから読み出して、前記第１の暗証番号で復号化して、第２の暗証番号を生成し、生成した第２の暗証番号を前記カード読み書き手段により前記ＩＣカードに送信する演算処理手段とを備え、前記ＩＣカード内部で前記第２の暗証番号が前記個別暗証番号と一致した場合に、前記サービスを正常実行することを特徴とするＩＣカード端末。

【請求項２】　前記ＩＣカードから取得した情報を蓄積しておく情報蓄積手段を設け、前記暗号化暗証番号を前記カード読み書き手段により前記ＩＣカードから読み出して、該情報蓄積手段に蓄積し、該情報蓄積手段に蓄積した前記暗号化暗証番号を読み出して、第１の暗証番号で復号することを特徴とする請求項１に記載のＩＣカード端末。

【請求項３】　前記暗号化暗証番号は、前記個別暗証番号と、特定の値からなる固定値データとを結合したものを、前記第１の暗証番号を用いて暗号化したものであり、前記演算処理手段は、前記暗号化暗証番号を、前記第１の暗証番号を用いて復号化したデータに、前記固定値データが正しくが含まれていれば、前記復号化して得られる前記第２の暗証番号は、前記個別暗証番号と等しいと判断することを特徴とする請求項１または請求項２に記載のＩＣカード端末。

【請求項４】　カード所有者の正当性確認が必要なサービスを処理するサービスプログラムが１個以上と、前記カード所有者の正当性確認を行うために用いる個別暗証番号を暗号化した暗号化暗証番号が１個以上記憶されたＩＣカードを用い、前記個別暗証番号を保管しているセンタ装置と通信するＩＣカード端末であって、前記カード所有者が第１の暗証番号の入力を行える暗証番号入力手段と、前記ＩＣカードと通信を行うカード読み書き手段と、ネットワークを介して前記センタ装置と通信する通信手段と、前記カード読み書き手段により前記ＩＣカードから読み出した前記暗号化暗証番号を、前記第１の暗証番号で復号化して、第２の暗証番号を生成し、前記第２の暗証番号を前記通信手段により前記センタ装置に送信する演算処理手段とを備え、前記センタ装置で前記第２の暗証番号が前記個別暗証番号と一致した場合に、前記サービスを正常実行することを特徴とするＩＣカード端末。

【請求項５】　前記ＩＣカードから取得した情報を蓄積しておく情報蓄積手段を設け、前記暗号化暗証番号を前記カード読み書き手段により前記ＩＣカードから読み出して、該情報蓄積手段に蓄積し、該情報蓄積手段に蓄積した前記暗号化暗証番号を読み出して、第１の暗証番号で復号することを特徴とする請求項４に記載のＩＣカード端末。

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【請求項６】　前記暗号化暗証番号は、前記個別暗証番号と、特定の値からなる固定値データとを結合したものを、前記第１の暗証番号を用いて暗号化したものであり、前記演算処理手段は、前記暗号化暗証番号を、前記第１の暗証番号を用いて復号化したデータに、前記固定値データが正しくが含まれていれば、前記復号化して得られる前記第２の暗証番号は、前記個別暗証番号と等しいと判断することを特徴とする請求項５記載のＩＣカード端末。

【請求項７】　カード所有者の正当性確認が必要なサービスを処理するサービスプログラムが１個以上と、前記カード所有者の正当性確認を行うために用いる個別暗証番号が１個以上と、前記個別暗証番号を暗号化した暗号化暗証番号が１個以上記憶されたＩＣカードと、前記ＩＣカードを用いて前記サービスを前記カード所有者に提供するＩＣカード端末とからなるシステムにおける本人認証方法であって、前記ＩＣカード端末が、前記暗号化暗証番号を前記ＩＣカードから読み出す処理ステップと、前記ＩＣカード端末が前記ＩＣカードから読み出した前記暗号化暗証番号を蓄積する処理ステップと、前記カード保持者が前記ＩＣカード端末に第１の暗証番号を入力する処理ステップと、前記ＩＣカード端末が蓄積している前記暗号化暗証番号を前記第１の暗証番号で復号化して第２の暗証番号を生成する処理ステップと、前記ＩＣカード端末が前記第２の暗証番号を前記ＩＣカードに送信して、前記ＩＣカード内部で前記第２の暗証番号が前記個別暗証番号と一致した場合に、前記サービスを正常実行する処理ステップとを含むことを特徴とする本人認証方法。

【請求項８】　カード所有者の正当性確認が必要なサービスを処理するサービスプログラムが１個以上と、前記カード所有者の正当性確認を行うために用いる個別暗証番号を暗号化した暗号化暗証番号が１個以上記憶されたＩＣカードと、前記ＩＣカードを用いて前記サービスを前記カード所有者に提供するＩＣカード端末と、前記ＩＣカード端末とネットワークを介して接続されていて前記個別暗証番号を保管しているセンタ装置とからなるシステムにおける本人認証方法であって、前記ＩＣカード端末が前記暗号化暗証番号を前記ＩＣカードから読み出す処理ステップと、前記ＩＣカード端末が前記ＩＣカードから読み出した前記暗号化暗証番号を蓄積する処理ステップと、前記カード保持者が前記ＩＣカード端末に第１の暗証番号を入力する処理ステップと、前記ＩＣカード端末が蓄積している前記暗号化暗証番号を前記第１の

暗証番号で復号化して第２の暗証番号を生成する処理ステップと、前記ＩＣカード端末が前記第２の暗証番号を前記センタ装置に送信して、前記センタ装置で前記第２の暗証番号が前記個別暗証番号と一致した場合に、前記サービスを正常実行する処理ステップとを含むことを特徴とする本人認証方法。

【請求項９】　カード所有者の正当性確認が必要なサービスを処理するサービスプログラムが１個以上と、前記カード所有者の正当性確認を行うために用いる個別暗証番号が１個以上と、前記個別暗証番号を暗号化した暗号化暗証番号が１個以上と、前記暗号化暗証番号を管理する暗証番号管理プログラムとが記憶されたＩＣカードと、前記ＩＣカードを用いて前記サービスを前記カード所有者に提供するＩＣカード端末とからなるシステムにおける本人認証方法であって、前記カード所有者が前記ＩＣカード端末に第１の暗証番号を入力する処理ステップと、前記ＩＣカード端末が前記第１の暗証番号を前記ＩＣカードに送信する処理ステップと、前記ＩＣカード内で実行される前記暗証番号管理プログラムが前記暗号化暗証番号を前記第１の暗証番号で復号化して第２の暗証番号を生成して、前記ＩＣカード端末に送信する処理ステップと、前記ＩＣカード端末が前記第２の暗証番号を前記ＩＣカードに送信して、前記ＩＣカード内部で前記第２の暗証番号が前記個別暗証番号と一致した場合に、前記サービスを正常実行する処理ステップとを含むことを特徴とする本人認証方法。

【請求項１０】　カード所有者の正当性確認が必要なサービスを処理するサービスプログラムが１個以上と、前記カード所有者の正当性確認を行うために用いる個別暗証番号が１個以上と、前記個別暗証番号を暗号化した暗号化暗証番号が１個以上と、前記暗号化暗証番号を管理する暗証番号管理プログラムとが記憶されたＩＣカードと、前記ＩＣカードを用いて前記サービスを前記カード所有者に提供するＩＣカード端末とからなるシステムにおける本人認証方法であって、前記カード保持者が前記ＩＣカード端末に第１の暗証番号を入力する処理ステップと、前記ＩＣカード端末が前記第１の暗証番号を前記ＩＣカードに送信する処理ステップと、前記ＩＣカード内で実行される前記暗証番号管理プログラムが前記暗号化暗証番号を前記第１の暗証番号で復号化して第２の暗証番号を生成する処理ステップと、前記暗証番号プログラムが、前記サービスプログラムに第２の暗証番号を送信して、前記第２の暗証番号が前記個別暗証番号と一致した場合に、前記サービスを正常実行する処理ステップとを含むことを特徴とする本人認証方法。

【請求項１１】　カード所有者の正当性確認が必要なサービスを処理するサービスプログラムが１個以上と、前記カード所有者の正当性確認を行うために用いる個別暗証番号が１個以上と、前記個別暗証番号を外部に出力することを保護する第１の暗証番号とが記憶されたＩＣカードを用いて前記サービスを前記カード所有者に提供するＩＣカード端末であって、前記カード所有者が第２の暗証番号の入力を行える暗証番号入力手段と、前記ＩＣカードと通信を行うカード読み書き手段と、前記第２の暗証番号を前記ＩＣカード読み書き手段により前記ＩＣカードに送信して、前記ＩＣカード内部で、前記第２の暗証番号が前記第１の暗証番号と一致した場合に、前記個別暗証番号を前記ＩＣカード読み書き手段により取得し、前記個別暗証番号を前記カード読み書き手段により前記ＩＣカードに送信して、前記ＩＣカード内部での前記個別暗証番号の照合が成功した場合に、前記サービスを正常実行する演算処理手段とを有することを特徴とするＩＣカード端末。

【請求項１２】　カード所有者の正当性確認が必要なサービスを処理するサービスプログラムが１個以上と、前記カード所有者の正当性確認を行うために用いる個別暗証番号が１個以上と、前記個別暗証番号を外部に出力することを保護する第１の生体情報と、生体情報を管理する管理プログラムとが記憶されたＩＣカードを用いて前記サービスを前記カード所有者に提供するＩＣカード端末において、第２の生体情報を前記カード所有者から読み取ることができる生体情報読み取り手段と、前記ＩＣカードと通信を行うカード読み書き手段と、前記第２の生体情報を前記ＩＣカード読み書き手段により前記ＩＣカードに送信して、前記ＩＣカード内部で、前記第２の生体情報が前記第１の生体情報と一致した場合に、前記個別暗証番号を前記ＩＣカード読み書き手段により取得し、前記個別暗証番号を前記カード読み書き手段により前記ＩＣカードに送信して、前記ＩＣカード内部での前記個別暗証番号の照合が成功した場合に、前記サービスを正常実行する演算処理手段とを有することを特徴とするＩＣカード端末。

【請求項１３】　前記第１の生体情報および前記第２の生体情報は、指紋を用いることを特徴とする請求項１２に記載のＩＣカード端末。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】本発明は、ＩＣカードを用いて本人認証を行なうＩＣカード端末装置および本人認証方法に関する。

【０００２】

【従来の技術】近年、ＩＣカードが磁気カードに代わって広く普及しつつある。これはＩＣカードには、記憶容量が大きい、暗号処理などを行なうための演算装置（マイクロプロセッサ）を備えている、容易に内部を観察できない（耐タンパ性を有している）といった、磁気カードにはない特徴があるからである。このような特徴を持ったＩＣカードを、決済システムや身分証明システムなどに適用することで、磁気カードに比べてセキュリティを向上させたり、磁気カードでは実現できなかった新し

いサービスを提供したりすることができる。例えば、決済システムが提供するサービスとしては電子マネーやクレジットカードがあり、身分証明システムが提供するサービスとしては社員ＩＤカードや運転免許証などがあげられる。

【０００３】ＩＣカードは、その通信方式により、接触型と非接触型に分類されており、それぞれの仕様はすでに標準化されている。例えば、接触型ＩＣカードは、ＩＳＯ（Ｉｎｔｅｒｎａｔｉｏｎａｌ　Ｏｒｇａｎｉｚａｔｉｏｎ　ｆｏｒ　Ｓｔａｎｄａｒｄｉｚａｔｉｏｎ：国際標準化機構）で、ＩＳＯ／ＩＥＣ７８１６として標準化されている。ＩＳＯ／ＩＥＣ７８１６に基づくＩＣカードは、端末から送信するコマンドに従って内部で演算を行い、結果をレスポンスとして返すということを順次行なっていくことで、サービスを実現するための処理を遂行していく。

【０００４】ここで、ＩＣカード－端末間で送受信するコマンドとレスポンスは、ＡＰＤＵ（Ａｐｐｌｉｃａｔｉｏｎ　Ｐｒｏｔｏｃｏｌ　Ｄａｔａ　Ｕｎｉｔ）という形式でＩＳＯ／ＩＥＣ７８１６で規定している。また、ＩＳＯ／ＩＥＣ７８１６に基づくＩＣカードは、図１３に示すようにプログラムやデータは階層構造を持ったファイルに格納される。

【０００５】図１３において、主ファイル（ＭＦ）９００は、最上位層のファイルでありＩＣカード内に一つだけ存在し、その下に複数の専用ファイル（ＤＦ）９０１Ａ、９０１Ｂ、および９０１Ｃが存在する。専用ファイルには特定のサービスを実行するためのプログラム（以下サービスプログラムと呼ぶ）とサービス実行に必要なデータ（以下サービスデータと呼ぶ）が格納される。専用ファイルはＩＣカード内に複数存在可能なので、複数のサービスプログラムとサービスデータを、異なる専用ファイルに格納することで、１枚のＩＣカードで複数のサービスを利用できるようになる。

【０００６】特定のサービスプログラムを実行するためには、まず端末が、ＡＰＤＵ形式のコマンドとして規定されている「ファイル選択コマンド」を用いて、特定のサービスプログラムが格納されている専用ファイルを、カレントのファイルとして選択する。これにより、それ以降にＩＣカードが端末から受信するコマンドは、選択されたサービスプログラムに従って処理されるようになる。ここで、各専用ファイルは、アプリケーション識別子（以下ＡＩＤと略す）と呼ばれるＩＤにより外部から識別可能である。例えば、「ファイル選択コマンド」は、ＡＩＤを指定することで、特定の専用ファイルを選択することができる。

【０００７】さて、ＩＣカードを用いてサービスを受ける場合、カード所有者本人がそのカードを使用していることの認証を行なうことが求められる場合があり、このために行う認証は本人認証と呼ばれる。本人認証を実現するための方法としては、ＰＩＮと呼ばれる暗証番号をカード所有者が端末に入力するＰＩＮ認証が一般的である。ＰＩＮ認証には、カード所有者が入力したＰＩＮをＩＣカード内に記憶しているＰＩＮと照合する「オフラインＰＩＮ認証」と、カード所有者が入力したＰＩＮを、ネットワークを介してセンタが保持しているＰＩＮと照合する「オンラインＰＩＮ認証」とがある。ＰＩＮ認証などの本人認証を行なうことは、ＩＣカードの不正利用を防止するために重要である。

【０００８】

【発明が解決しようとする課題】以上説明したように、ＩＣカードを用いることで、様々なサービスを１枚のＩＣカードで利用できるようになるが、一方で、各サービスを利用するためにＰＩＮ認証を行なう場合に、カード所有者はサービス毎に異なるＰＩＮを覚えておき、利用するサービス毎にＰＩＮを使い分けなければならない可能性がある。これはカード利用者の利便性を大きく損なう要因となる。

【０００９】そこで、本発明は、ＩＣカード所有者が、複数のサービスに対応したＩＣカードを用いて各サービスを受ける場合に、サービス毎に行なう必要のあるＰＩＮ認証を、共通のＰＩＮを一つ覚えておくだけで実行できる構成にすることで、ＩＣカード所有者の利便性を向上できるＩＣカード端末および、本人認証方法を提供することを目的とする。

【００１０】

【課題を解決するための手段】上記目的を達成するために、本発明では、カード所有者の正当性確認が必要なサービスを処理するサービスプログラムが１個以上と、前記カード所有者の正当性確認を行うために用いる個別暗証番号が１個以上と、前記個別暗証番号を暗号化した暗号化暗証番号が１個以上記憶されたＩＣカードを用いるＩＣカード端末が、前記カード所有者が第１の暗証番号の入力を行える暗証番号入力手段と、前記ＩＣカードと通信を行うカード読み書き手段と、前記ＩＣカードから取得した情報を蓄積しておく情報蓄積手段と、前記暗号化暗証番号を前記カード読み書き手段により前記ＩＣカードから読み出して、前記情報蓄積手段に蓄積し、前記情報蓄積手段に蓄積した前記暗号化暗証番号を読み出して、前記第１の暗証番号で復号化して、第２の暗証番号を生成し、前記第２の暗証番号を前記カード読み書き手段により前記ＩＣカードに送信して、前記ＩＣカード内部で前記第２の暗証番号が前記個別暗証番号と一致した場合に、前記サービスを正常実行する演算処理手段とを有している。

【００１１】また、本発明では、カード所有者の正当性確認が必要なサービスを処理するサービスプログラムが１個以上と、前記カード所有者の正当性確認を行うために用いる個別暗証番号が１個以上と、前記個別暗証番号を暗号化した暗号化暗証番号が１個以上記憶されたＩＣ

カードと、前記ＩＣカードを用いて前記サービスを前記カード所有者に提供するＩＣカード端末とからなるシステムにおける本人認証方法が、前記ＩＣカード端末が前記暗号化暗証番号を前記ＩＣカードから読み出す処理ステップと、前記ＩＣカード端末が前記ＩＣカードから読み出した前記暗号化暗証番号を蓄積する処理ステップと、前記カード保持者が前記ＩＣカード端末に第１の暗証番号を入力する処理ステップと、前記ＩＣカード端末が蓄積している前記暗号化暗証番号を前記第１の暗証番号で復号化して第２の暗証番号を生成する処理ステップと、前記ＩＣカード端末が前記第２の暗証番号を前記ＩＣカードに送信して、前記ＩＣカード内部で前記第２の暗証番号が前記個別暗証番号と一致した場合に、前記サービスを正常実行する処理ステップとを含んでいる。

【００１２】すなわち、上記課題を解決するために、本発明は、カード所有者の正当性確認が必要なサービスを処理するサービスプログラムが１個以上と、前記カード所有者の正当性確認を行うために用いる個別暗証番号が１個以上と、前記個別暗証番号を暗号化した暗号化暗証番号が１個以上記憶されたＩＣカードを用いるＩＣカード端末が、前記カード所有者が第１の暗証番号の入力を行える暗証番号入力手段と、前記ＩＣカードと通信を行うカード読み書き手段と、前記暗号化暗証番号を前記カード読み書き手段により前記ＩＣカードから読み出して、前記第１の暗証番号で復号化して、第２の暗証番号を生成し、生成した第２の暗証番号を前記カード読み書き手段により前記ＩＣカードに送信する演算処理手段とを備え、前記ＩＣカード内部で前記第２の暗証番号が前記個別暗証番号と一致した場合に、前記サービスを正常実行するようにした。

【００１３】本発明は、上記ＩＣカード端末において、前記ＩＣカードから取得した情報を蓄積しておく情報蓄積手段を設け、前記暗号化暗証番号を前記カード読み書き手段により前記ＩＣカードから読み出して、該情報蓄積手段に蓄積し、該情報蓄積手段に蓄積した前記暗号化暗証番号を読み出して、第１の暗証番号で復号するようにした。

【００１４】本発明は、上記ＩＣカード端末において、前記暗号化暗証番号は、前記個別暗証番号と、特定の値からなる固定値データとを結合したものを、前記第１の暗証番号を用いて暗号化したものであり、前記演算処理手段は、前記暗号化暗証番号を、前記第１の暗証番号を用いて復号化したデータに、前記固定値データが正しくが含まれていれば、前記復号化して得られる前記第２の暗証番号は、前記個別暗証番号と等しいと判断することとした。

【００１５】上記課題を解決するために、本発明は、カード所有者の正当性確認が必要なサービスを処理するサービスプログラムが１個以上と、前記カード所有者の正当性確認を行うために用いる個別暗証番号を暗号化した暗号化暗証番号が１個以上記憶されたＩＣカードを用い、前記個別暗証番号を保管しているセンタ装置と通信するＩＣカード端末が、前記カード所有者が第１の暗証番号の入力を行える暗証番号入力手段と、前記ＩＣカードと通信を行うカード読み書き手段と、ネットワークを介して前記センタ装置と通信する通信手段と、前記カード読み書き手段により前記ＩＣカードから読み出した前記暗号化暗証番号を、前記第１の暗証番号で復号化して、第２の暗証番号を生成し、前記第２の暗証番号を前記通信手段により前記センタ装置に送信する演算処理手段とを備え、前記センタ装置で前記第２の暗証番号が前記個別暗証番号と一致した場合に、前記サービスを正常実行することとした。

【００１６】本発明は、上記ＩＣカード端末において、前記ＩＣカードから取得した情報を蓄積しておく情報蓄積手段を設け、前記暗号化暗証番号を前記カード読み書き手段により前記ＩＣカードから読み出して、該情報蓄積手段に蓄積し、該情報蓄積手段に蓄積した前記暗号化暗証番号を読み出して、第１の暗証番号で復号するようにした。

【００１７】本発明は、上記ＩＣカード端末において、前記暗号化暗証番号は、前記個別暗証番号と、特定の値からなる固定値データとを結合したものを、前記第１の暗証番号を用いて暗号化したものであり、前記演算処理手段は、前記暗号化暗証番号を、前記第１の暗証番号を用いて復号化したデータに、前記固定値データが正しくが含まれていれば、前記復号化して得られる前記第２の暗証番号は、前記個別暗証番号と等しいと判断することとした。

【００１８】上記課題を解決するために、本発明は、カード所有者の正当性確認が必要なサービスを処理するサービスプログラムが１個以上と、前記カード所有者の正当性確認を行うために用いる個別暗証番号が１個以上と、前記個別暗証番号を暗号化した暗号化暗証番号が１個以上記憶されたＩＣカードと、前記ＩＣカードを用いて前記サービスを前記カード所有者に提供するＩＣカード端末とからなるシステムにおける本人認証方法が、前記ＩＣカード端末が、前記暗号化暗証番号を前記ＩＣカードから読み出す処理ステップと、前記ＩＣカード端末が前記ＩＣカードから読み出した前記暗号化暗証番号を蓄積する処理ステップと、前記カード保持者が前記ＩＣカード端末に第１の暗証番号を入力する処理ステップと、前記ＩＣカード端末が蓄積している前記暗号化暗証番号を前記第１の暗証番号で復号化して第２の暗証番号を生成する処理ステップと、前記ＩＣカード端末が前記第２の暗証番号を前記ＩＣカードに送信して、前記ＩＣカード内部で前記第２の暗証番号が前記個別暗証番号と一致した場合に、前記サービスを正常実行する処理ステップとを含むようにした。

【００１９】上記課題を解決するために、本発明は、カ

ード所有者の正当性確認が必要なサービスを処理するサービスプログラムが１個以上と、前記カード所有者の正当性確認を行うために用いる個別暗証番号を暗号化した暗号化暗証番号が１個以上記憶されたＩＣカードと、前記ＩＣカードを用いて前記サービスを前記カード所有者に提供するＩＣカード端末と、前記ＩＣカード端末とネットワークを介して接続されていて前記個別暗証番号を保管しているセンタ装置とからなるシステムにおける本人認証方法が、前記ＩＣカード端末が前記暗号化暗証番号を前記ＩＣカードから読み出す処理ステップと、前記ＩＣカード端末が前記ＩＣカードから読み出した前記暗号化暗証番号を蓄積する処理ステップと、前記カード保持者が前記ＩＣカード端末に第１の暗証番号を入力する処理ステップと、前記ＩＣカード端末が蓄積している前記暗号化暗証番号を前記第１の暗証番号で復号化して第２の暗証番号を生成する処理ステップと、前記ＩＣカード端末が前記第２の暗証番号を前記センタ装置に送信して、前記センタ装置で前記第２の暗証番号が前記個別暗証番号と一致した場合に、前記サービスを正常実行する処理ステップとを含むようにした。

【００２０】上記課題を解決するために、本発明は、カード所有者の正当性確認が必要なサービスを処理するサービスプログラムが１個以上と、前記カード所有者の正当性確認を行うために用いる個別暗証番号が１個以上と、前記個別暗証番号を暗号化した暗号化暗証番号が１個以上と、前記暗号化暗証番号を管理する暗証番号管理プログラムとが記憶されたＩＣカードと、前記ＩＣカードを用いて前記サービスを前記カード所有者に提供するＩＣカード端末とからなるシステムにおける本人認証方法が、前記カード所有者が前記ＩＣカード端末に第１の暗証番号を入力する処理ステップと、前記ＩＣカード端末が前記第１の暗証番号を前記ＩＣカードに送信する処理ステップと、前記ＩＣカード内で実行される前記暗証番号管理プログラムが前記暗号化暗証番号を前記第１の暗証番号で復号化して第２の暗証番号を生成して、前記ＩＣカード端末に送信する処理ステップと、前記ＩＣカード端末が前記第２の暗証番号を前記ＩＣカードに送信して、前記ＩＣカード内部で前記第２の暗証番号が前記個別暗証番号と一致した場合に、前記サービスを正常実行する処理ステップとを含むようにした。

【００２１】上記課題を解決するために、本発明は、カード所有者の正当性確認が必要なサービスを処理するサービスプログラムが１個以上と、前記カード所有者の正当性確認を行うために用いる個別暗証番号が１個以上と、前記個別暗証番号を暗号化した暗号化暗証番号が１個以上と、前記暗号化暗証番号を管理する暗証番号管理プログラムとが記憶されたＩＣカードと、前記ＩＣカードを用いて前記サービスを前記カード所有者に提供するＩＣカード端末とからなるシステムにおける本人認証方法が、前記カード保持者が前記ＩＣカード端末に第１の暗証番号を入力する処理ステップと、前記ＩＣカード端末が前記第１の暗証番号を前記ＩＣカードに送信する処理ステップと、前記ＩＣカード内で実行される前記暗証番号管理プログラムが前記暗号化暗証番号を前記第１の暗証番号で復号化して第２の暗証番号を生成する処理ステップと、前記暗証番号プログラムが、前記サービスプログラムに第２の暗証番号を送信して、前記第２の暗証番号が前記個別暗証番号と一致した場合に、前記サービスを正常実行する処理ステップとを含むようにした。

【００２２】上記課題を解決するために、本発明は、カード所有者の正当性確認が必要なサービスを処理するサービスプログラムが１個以上と、前記カード所有者の正当性確認を行うために用いる個別暗証番号が１個以上と、前記個別暗証番号を外部に出力することを保護する第１の暗証番号とが記憶されたＩＣカード用いて前記サービスを前記カード所有者に提供するＩＣカード端末が、前記カード所有者が第２の暗証番号の入力を行える暗証番号入力手段と、前記ＩＣカードと通信を行うカード読み書き手段と、前記第２の暗証番号を前記ＩＣカード読み書き手段により前記ＩＣカードに送信して、前記ＩＣカード内部で、前記第２の暗証番号が前記第１の暗証番号と一致した場合に、前記個別暗証番号を前記ＩＣカード読み書き手段により取得し、前記個別暗証番号を前記カード読み書き手段により前記ＩＣカードに送信して、前記ＩＣカード内部での前記個別暗証番号の照合が成功した場合に、前記サービスを正常実行する演算処理手段とを備えた。

【００２３】上記課題を解決するために、本発明は、カード所有者の正当性確認が必要なサービスを処理するサービスプログラムが１個以上と、前記カード所有者の正当性確認を行うために用いる個別暗証番号が１個以上と、前記個別暗証番号を外部に出力することを保護する第１の生体情報と、生体情報を管理する管理プログラムとが記憶されたＩＣカードを用いて前記サービスを前記カード所有者に提供するＩＣカード端末が、第２の生体情報を前記カード所有者から読み取ることができる生体情報読み取り手段と、前記ＩＣカードと通信を行うカード読み書き手段と、前記第２の生体情報を前記ＩＣカード読み書き手段により前記ＩＣカードに送信して、前記ＩＣカード内部で、前記第２の生体情報が前記第１の生体情報と一致した場合に、前記個別暗証番号を前記ＩＣカード読み書き手段により取得し、前記個別暗証番号を前記カード読み書き手段により前記ＩＣカードに送信して、前記ＩＣカード内部での前記個別暗証番号の照合が成功した場合に、前記サービスを正常実行する演算処理手段とを備えた。

【００２４】本発明は、上記ＩＣカード端末において、前記第１の生体情報および前記第２の生体情報として、指紋を用いた。

【００２５】

【発明の実施の形態】以下、本発明の実施形態について説明していく。ここで、以下の実施形態では、接触型のＩＣカードを用いた場合について説明していくが、接触型であることは本発明に必要な項目では無く、例えば非接触ＩＣカードであっても本発明は適用可能である。また、以下の実施形態では、端末とＩＣカードとの間で送受信するコマンドは、ＡＰＤＵ形式のコマンドを想定しているが、ＡＰＤＵ形式のコマンドを用いることは本発明に必要な項目では無く、ＡＰＤＵ形式と同等の機能を実現できるコマンドセットであれば、どのようなものを用いても本発明は適用可能である。さらに、以下の実施形態では、端末として電子マネーやクレジットカードのための決済を行なう機能を有した端末を想定しているが、このような端末であることは本発明に必要な項目ではなく、本人認証を行なう端末であれば本発明は適用可能である。

【００２６】まず、第１の実施形態について説明する。図１に、本人認証を行う本実施形態に係わるＩＣカードおよび端末の構成を示す。図１において、本人認証は、決済端末１００と、ＩＣカード１０１と、カード所有者１０２と、店員１０３と、ネットワーク１０４との間で行われる。図１に示した構成は、カード所有者１０２が、ＩＣカード１０１を用いて、電子マネーやクレジットカードによる決済を行なうことを想定している。したがって、決済端末１００は、ＩＣカードによる決済機能を備えた端末であり、例えばクレジット端末や金融機関のＡＴＭを想定している。また、ＩＣカード１０１は、電子マネーやクレジットカード等の複数のサービスを提供できる構成となっている。カード所有者１０２は、本人認証のために使用するＰＩＮであってＩＣカード１０１が提供する複数のサービスで共通に使用できる共通ＰＩＮ１０５を、記憶しているものとする。

【００２７】次に、決済端末１００の内部構成について説明する。決済端末１００は、カード読み書き手段１１０、演算処理手段１１１、表示装置１１２、ＰＩＮ入力手段１１３、情報蓄積手段１１４、操作手段１１５、通信手段１１６を有する。

【００２８】カード読み書き手段１１０は、ＩＣカード１０１と通信するために、ＩＣカード１０１にコマンドを送信（書込み）したり、ＩＣカードからレスポンスを受信（読み込み）したりする機能を有する。

【００２９】演算処理手段１１１は、例えばマイクロプロセッサとプログラム格納メモリから成り、プログラム格納メモリに格納されているプログラムに基づいて、決済端末１００全体を制御し、決済処理を遂行する機能を有する。

【００３０】表示手段１１２は、カード所有者１０２に対して、例えば決済金額等の各種情報を表示する。

【００３１】ＰＩＮ入力手段１１３は、カード所有者１０２が本人認証のためのＰＩＮを、例えばテンキー等を用いて入力できる機能を有する。

【００３２】情報蓄積手段１１４は、ＩＣカード１０１やネットワーク１０４から取得した情報、あるいは、カード所有者１０２や店員１０３が入力した情報を一時的あるいは永続的に蓄積する機能を有し、例えばハードディスクや半導体メモリ等から構成される。

【００３３】操作手段１１５は、店員１０３が決済端末１００を操作するためのインターフェイスを提供し、例えば、キーボード、バーコードリーダ、ディスプレイ等から構成される。

【００３４】通信手段１１６は、ネットワーク１０４を介してセンタと通信する機能を有し、例えばオンラインＰＩＮ認証を行なうために使用する。ここで、決済端末１００が金融機関ＡＴＭ等の無人端末の場合は、操作手段１１５は無くてもよく、店員１０３も存在しなくてよい。また、決済端末１００による決済処理がオフラインで完了するような場合は、通信手段１１６は無くてもよい。

【００３５】次に、ＩＣカード１０１の内部構成について説明する。ＩＣカード１０１は、通信手段１１７、情報蓄積手段１１８、演算処理手段１１９を有する。

【００３６】通信手段１１７は、決済端末１００のカード読み書き手段１１０と通信を行ない、決済端末１００からコマンドを受信したり、決済端末１００にレスポンスを返信したりする機能を有する。

【００３７】情報蓄積手段１１８は、ＩＣカードが提供するサービスを実行するプログラムやデータ、あるいは決済端末１００から取得した情報等を一時的あるいは永続的に格納する機能を有し、例えば、ＲＯＭ（Ｒｅａｄ Ｏｎｌｙ Ｍｅｍｏｒｙ）、ＲＡＭ（Ｒａｎｄｏｍ Ａｃｃｅｓｓ Ｍｅｍｏｒｙ）、フラッシュメモリ等の半導体メモリから構成される。

【００３８】演算処理手段１１９は、マイクロプロセッサを用いることで、ＩＣカード全体の制御を司り、情報蓄積手段１１８に格納されているプログラムを実行する機能を有する。

【００３９】次に、本実施形態に係わるＩＣカード１０１に格納される情報の構成を図２に示す。図２は、ＩＣカード１０１を構成する情報蓄積手段１１８内部のファイル構成であり、主ファイル（ＭＦ）１２０、専用ファイル（ＤＦ）１２１Ａ、１２１Ｂ、１２１Ｃ、およびＰＩＮ管理専用ファイル１２２から構成される。これらのファイルは階層構造となっており、主ファイル１２０が最上位に位置し、その下位層に、専用ファイル１２１Ａ、１２１Ｂ、１２１Ｃ、およびＰＩＮ管理専用ファイル１２２が位置する構成となっている。それぞれの専用ファイルには異なるＡＩＤが割り当てられており、外部から識別可能である。

【００４０】次に、専用ファイル１２１Ａ、１２１Ｂおよび１２１Ｃの内部構成について説明する。専用ファイ

ル１２１Ａには、特定の決済サービスを実行するサービスプログラム１３１Ａと、この決済サービスにおいて本人認証をオフラインＰＩＮ認証により実行するために必要なデータである、個別ＰＩＮ１４１Ａが格納されている。同様に専用ファイル１２１Ｂには、サービスプログラム１３１Ｂと、個別ＰＩＮ１４１Ｂが格納されている。また、専用ファイル１２１Ｃには、サービスプログラム１３１Ｃが格納されていて、サービスプログラム１３１Ｃにより実行される決済サービスは、本人認証として、オンラインＰＩＮ認証を行なうものとする。したがって、専用ファイル１２１Ｃ内には、ＰＩＮデータは格納されていない。

【００４１】次に、ＰＩＮ管理専用ファイル１２２について説明する。ＰＩＮ管理専用ファイル１２２は、ＰＩＮ管理用の専用ファイルである。ＰＩＮ管理専用ファイル１２２には、サービスプログラム１３１Ａ、１３１Ｂ、および１３１Ｃで個別に使用する個別ＰＩＮを管理するＰＩＮ管理プログラム１３２と、ＰＩＮ管理プログラム１３２が管理するデータである、ＰＩＮ管理データ１４２Ａ、１４２Ｂ、および１４２Ｃとが格納されている。ここでＰＩＮ管理データ１４２Ａは、サービスプログラム１３１Ａにより実行されるオフラインＰＩＮ認証に必要なデータが含まれている。同様に、ＰＩＮ管理データ１４２Ｂは、サービスプログラム１３１Ｂにより実行されるオフラインＰＩＮ認証に必要なデータが含まれている。また、ＰＩＮ管理データ１４２Ｃは、サービスプログラム１３１Ｃにより実行されるオンラインＰＩＮ認証に必要なデータが含まれている。

【００４２】この説明では、情報蓄積手段１１８には、３つのサービスプログラムが含まれていて、ＰＩＮ管理プログラムは３つのＰＩＮ管理データを管理している構成になっているが、任意の数のサービスプログラムが含まれているＩＣカードにも本発明は適用可能である。例えば、ＩＣカード１０１が４個のサービスプログラムを含む場合は、ＰＩＮ管理プログラムは、４個のＰＩＮ管理データを管理すればよい。さらに、本発明は、ＩＣカード１０１内のサービスプログラムがオンラインＰＩＮ認証を行なう構成であっても、オフラインＰＩＮ認証を行なう構成であっても適用することができる。

【００４３】次に、本実施形態に係わるＰＩＮ管理プログラム１３２が管理しているＰＩＮ管理データの構成と使用方法について説明していく。まず、ＰＩＮ管理データの構成と生成手順を図３に示す。図３において、ＰＩＮ管理データ１４２は、ＡＩＤ２０２と、制御フラグ２０３と、暗号化個別ＰＩＮ２０４が含まれる構成となっている。ＡＩＤ２０２は、ＰＩＮ管理データ１４２が対応しているサービスプログラムが格納されている専用ファイルのアプリケーション識別子である。制御フラグ２０３はＰＩＮ管理データ１４２が対応するＰＩＮ認証方式（オンラインあるいはオフライン）を示す。例えば、制御フラグ２０３に１ビットを割り当てて、「０」の場合はオンライン用の個別ＰＩＮ、「１」の場合はオフライン用の個別ＰＩＮがＰＩＮ管理データ１４２に保持されているものとする。暗号化個別ＰＩＮ２０４は、個別ＰＩＮを暗号化したものであり、暗号化個別ＰＩＮ２０４だけからでは元の個別ＰＩＮの内容は推測できない。

【００４４】ＰＩＮ管理データ１４２の生成手順としては、まず、ステップＳ２００として、正しいＡＩＤ２０２を設定する。次にステップＳ２０１として、正しい制御フラグ２０３を設定する。次に、ステップＳ２０２として、個別ＰＩＮ１４１と固定パターン２０１を結合したデータを、カード所有者が設定した共通ＰＩＮ１０５を暗号鍵として暗号化処理を行い、出力される暗号文を暗号化個別ＰＩＮ２０４とする。ここで、固定パターン２０１はある特定のビット列であり、固定値として定めておく。またステップＳ２０２で実行する暗号化処理としては、例えばブロック暗号方式に基づいた暗号アルゴリズムであるＤＥＳを用いることが考えられる。あるいは他の暗号化アルゴリズムを用いてもよい。

【００４５】以上の生成手順は、新しくＰＩＮ管理データ１４２を登録する時、共通ＰＩＮ１０５を変更する時、および個別ＰＩＮ１４１を変更する時に行われる。共通ＰＩＮを変更する場合は、新しい共通ＰＩＮで生成したＰＩＮ管理データを、今までのＰＩＮ管理データと置き換えればよい。同様に、個別ＰＩＮを変更する場合は、新しい個別ＰＩＮから生成したＰＩＮ管理データを、今までのＰＩＮ管理データと置き換えればよい。

【００４６】次に、ＰＩＮ管理データから個別ＰＩＮを抽出する処理手順を図４に示す。この処理手順は、図１に示した決済端末１００を構成する演算処理手段１１１を用いることで実行される。図４において、ＰＩＮ管理データ１４２は、前述したように、ＡＩＤ２０２と、制御フラグ２０３と、暗号化個別ＰＩＮ２０４が含まれる構成となっている。

【００４７】まず、ステップＳ３００としてＡＩＤ２０２をチェックし、個別ＰＩＮを使用するサービスプログラムが格納されている専用ファイルのアプリケーション識別子と一致するかを調べる。もし、ＡＩＤが一致しなければ本処理を不正終了する。ＡＩＤが一致するならば、次にステップＳ３０１として、制御フラグ２０３をチェックし、制御フラグ２０３か示すＰＩＮ認証方式（オフラインあるいはオンライン）と、個別ＰＩＮを使用するサービスプログラムが行なうＰＩＮ認証方式とが一致するかを調べる。もし、ＰＩＮ認証方式が一致しなければ処理を不正終了する。ＰＩＮ認証方式が一致する場合は、次にステップＳ３０２として、共通ＰＩＮ１０５を暗号鍵として、復号化処理を行い、出力される平文を個別ＰＩＮ１４１と固定パターン２０１とに分離する。ここで、共通ＰＩＮ１０５としては、カード所有者１０２が、端末１００に入力したものを使用する。

【００４８】次に、ステップＳ３０３として、取得した固定パターン２０１が正しい値であるかどうかを検証する。ここで、端末１００は固定パターンの正しい値を予め知っているものとする。もし、固定パターン２０１が正しい値でなければ、本処理を不正終了する。固定パターン２０１が正しい値であれば、個別ＰＩＮ１４１を正しく取得できたと見なして、本処理を正常終了する。

【００４９】次に、本実施形態に係わる決済端末１００の処理フローを説明していく。図５は、カード所有者１０２が、ＩＣカード１０１を用いて、決済端末１００で決済処理を行なうときのフロー図である。ここで、この決済処理は、図１で示した決済端末１００を構成する演算処理手段１１１を用いて実行するものとする。また、この例では、ＩＣカードは、サービスプログラム１３１と、ＰＩＮ管理プログラム１３２を格納しているが、決済端末１００はＩＣカード１０１内に格納されている複数のプログラムと同時には通信を行なわないものとする。また、決済端末１００がＩＣカード１０１に送信するコマンドはＡＰＤＵ形式を用いるものとして説明していく。

【００５０】まず、ＩＣカード１０１が決済端末１００に挿入されると、ステップＳ５００としてＩＣカードの初期化処理を行なう。この処理では、決済端末１００がＩＣカード１０１にリセット要求を送信し、その後ＩＣカード１０１からリセット応答を受信するといったことが行なわれる。次に、決済端末１００は、ステップＳ５０１としてＩＣカード１０１に格納されている全てのＰＩＮ管理データを読み出す。この処理では、まず決済端末１００が、ファイル選択コマンドをＩＣカード１０１に発行することで、ＰＩＮ管理プログラム１３２が格納されているＰＩＮ管理専用ファイルを選択する。つづいて、決済端末１００がデータ読出しコマンドをＰＩＮ管理プログラム１３２に発行することで、ＰＩＮ管理データ１４２を全て読み出す。読み出されたＰＩＮ管理データは、図１に示した情報蓄積手段１１４に格納しておく。

【００５１】次に、ステップＳ５０２として、端末１００は、カード所有者１０２の選択等により、ＩＣカード１０１内に格納されているサービスプログラム１３１を選択する。この処理では、まず決済端末１００が、ファイル選択コマンドをＩＣカード１０１に発行することで、サービスプログラム１３１が格納されている専用ファイルを選択する。つづいて、決済端末１００が特定のコマンドをサービスプログラム１３１に発行していくことで、サービスプログラム１３１に基づいた処理を、ＰＩＮ認証が必要になるまで行なっていく。

【００５２】次に、カード所有者１０２が共通ＰＩＮ１０５を入力すると、ステップＳ５０３として、端末１００に入力された共通ＰＩＮを用いて、先にＩＣカードから読み出したＰＩＮ管理データから個別ＰＩＮを復号する。この処理では、ＩＣカードから読み出した全てのＰＩＮ管理データに対して、図４を用いて説明した個別ＰＩＮを抽出する処理を成功するまで実行する。ここで、もし個別ＰＩＮの抽出処理が失敗に終わったら、決済処理を中断するという運用方法がまず考えられる。あるいは、個別ＰＩＮの抽出処理が失敗したら、端末１００に入力された共通ＰＩＮを個別ＰＩＮとみなして以降の決済処理を継続するといった運用方法も考えられる。後者の場合については、ステップＳ５０３としてカード所有者１０２は、共通ＰＩＮあるいは個別ＰＩＮのいずれかを入力してよい場合の運用方法になる。

【００５３】次に、ステップＳ５０４として、ＰＩＮ認証をオフラインで行なうかオンラインで行なうかをチェックする。もしオフラインＰＩＮ認証を行なうなら、ステップＳ５０５として、決済端末１００は抽出した個別ＰＩＮをＩＣカード１０１に送信する。この処理では、決済端末１００はＰＩＮ検証コマンドをサービスプログラム１３１に発行することで、ＩＣカード１０１に個別ＰＩＮを送信し、内部で個別ＰＩＮの照合を行なわせる。一方でもしオンライン認証を行なうのなら、ステップＳ５０６として、決済端末１００は抽出した個別ＰＩＮを、ネットワークを介してセンタに送信する。以上説明した手順に従って、オフラインＰＩＮ認証あるいはオンラインＰＩＮ認証が終了した後、ステップＳ５０７として、端末１００は残りの決済処理を、ＩＣカード１０１に特定のコマンド発行するなどして継続していく。

【００５４】次に、第２の実施形態について説明する。本実施形態に係わるＩＣカードおよび決済端末の構成は、第１の実施形態で図１を用いて説明で示した構成と同様である。また、本実施形態に係わるＩＣカードに格納される情報の構成は、第１の実施形態で図２を用いて説明した構成と同様である。さらに、ＰＩＮ管理データから個別ＰＩＮを抽出する処理手順は、第１の実施形態で図４を用いて説明した処理手順と同様である。ただし本実施形態では、端末１００は、ＩＣカード１０１に格納されているＰＩＮ管理プログラム、および複数のサービスプログラムと、同時に通信することが可能であるものとする。また、本実施形態では、ＩＣカード１０１に格納されているＰＩＮ管理プログラム１３２が、ＰＩＮ管理データから個別ＰＩＮを抽出する処理を行なうものとする。

【００５５】以下、本実施形態の実現方法について示す。まず、図６は、ＡＰＤＵ形式のコマンドの構成図である。図６において、ＡＰＵＤ形式のコマンドは、クラス６１０、命令６１１、パラメータ１（６１２）、パラメータ２（６１３）、Ｌｃ６１４、データ６１５、およびＬｅ６１６から構成される。クラス６１０は、コマンドを用いて通信するサービスプログラムの識別子である。命令６１１は、コマンドの命令コードを示す。パラメータ１（６１２）とパラメータ２（６１３）は、命令

６１１に依存したパラメータの値を格納する。Ｌｃ６１４は、次のフィールドであるデータ６１５の長さを表す。データ６１５はＩＣカードに送信するデータを格納するフィールドである。Ｌｅ６１６はＩＣカードから送り返されるレスポンスの長さを表す。

【００５６】さらに、図６において、クラス６１０は、命令タイプ６２０、セキュリティメッセージタイプ６２１、および論理チャンネル番号６２２から構成される。命令タイプ６２０は、命令６１１を分類するためのフィールドである。セキュリティメッセージタイプは、データ６１５の盗聴や改ざんを防止するための暗号化処理を行なうかどうかを表すフィールドである。論理チャンネル番号６２２は、ＩＣカードに格納されているプログラムに発行するコマンドを論理的なアドレスを用いて区別するために用いる。すなわち、論理チャンネル番号６２２の値を異ならせることで、ＩＣカード内の複数のプログラムと、同時に通信することが可能になる。

【００５７】以上の説明では、ＡＰＤＵ形式のコマンドを例にとって説明したが、論理チャンネルを用いた機能と同等の機能を有していれば、他の形式のコマンドであっても、本発明に適用可能である。

【００５８】次に、本実施形態に係わる決済端末１００の処理フローを説明していく。図７は、カード所有者１０２が、ＩＣカード１０１を用いて、決済端末１００で決済処理を行なうときのフロー図である。この例では、決済端末１００がＩＣカード１０１に送信するコマンドはＡＰＤＵ形式を用いるものとして説明していく。また、ＩＣカードは、サービスプログラム１３１とＰＩＮ管理プログラム１３２を格納しており、決済端末１００は、サービスプログラム１３１に発行するコマンドの論理チャンネル番号として、論理チャンネルＡを用い、ＰＩＮ管理プログラム１３２に発行するコマンドの論理チャンネル番号として、論理チャンネルＢを用いて、同時に通信を行なうものとする。

【００５９】まず、ＩＣカード１０１が決済端末１００に挿入されると、ステップＳ７００としてＩＣカードの初期化処理を行なう。この処理では、決済端末１００がＩＣカード１０１にリセット要求を送信し、その後ＩＣカード１０１からリセット応答を受信するといったことが行なわれる。

【００６０】次に、決済端末１００は、ステップＳ７０１として、カード所有者１０２の選択等により、ＩＣカード１０１内に格納されているサービスプログラム１３１を選択する。この処理では、まず決済端末１００が、ファイル選択コマンドを、論理チャンネルＡを用いてＩＣカード１０１に発行することで、サービスプログラム１３１が格納されている専用ファイルを選択する。つづいて、決済端末１００が特定のコマンドを論理チャンネルＡを用いてサービスプログラム１３１に発行していくことで、サービスプログラム１３１に基づいた処理を、ＰＩＮ認証が必要になるまで行なっていく。

【００６１】ここで、ＰＩＮ認証を実行する前に、決済端末１００は、ステップＳ７０２として、ファイル選択コマンドを論理チャンネルＢを用いてＩＣカード１０１に発行し、ＰＩＮ管理プログラム１３２が格納されている専用ファイルを選択しておく。

【００６２】次に、カード所有者１０２が共通ＰＩＮを決済端末１００に入力すると、ステップＳ７０３として、決済端末１００は、共通ＰＩＮをＩＣカード１０１に送信し、ＩＣカード１０１から個別ＰＩＮを返信してもらう。この処理では、決済端末１００は論理チャンネルＢを用いて、個別ＰＩＮ取得コマンドを、ＰＩＮ管理プログラム１３２に発行する。ここで、個別ＰＩＮ取得コマンドには共通ＰＩＮ、サービスプログラム１３１に対応するアプリケーション識別子ＡＩＤ、および取得したい個別ＰＩＮがオンライン用かオフライン用かを表すフラグが格納されるものとする。ＰＩＮ管理プログラム１３２はこれらのデータを取得すると、第１の実施形態で図４を用いて説明した処理手順に従って、個別ＰＩＮを抽出し、決済端末１００に返信する。

【００６３】次に、ステップＳ７０４として、決済端末１００は、ＰＩＮ認証をオフラインで行なうかオンラインで行なうかをチェックする。

【００６４】もし、オフラインＰＩＮ認証を行なうなら、ステップＳ７０５として、決済端末１００は取得した個別ＰＩＮをＩＣカード１０１に送信する。この処理では、決済端末１００はＰＩＮ検証コマンドをサービスプログラム１３１に発行することで、ＩＣカード１０１内部で個別ＰＩＮの照合を行なわせる。

【００６５】一方で、もし、オンライン認証を行なうのなら、ステップＳ７０６として、決済端末１００は取得した個別ＰＩＮを、ネットワークを介してセンタに送信する。

【００６６】以上説明した手順に従って、オフラインＰＩＮ認証あるいはオンラインＰＩＮ認証が終了した後、ステップＳ７０７として、端末１００は残りの決済処理を、ＩＣカード１０１に特定のコマンド発行するなどして継続していく。

【００６７】次に、第３の実施形態について説明する。本実施形態に係わるＩＣカードおよび決済端末の構成、およびＩＣカードに格納される情報の構成は、第２の実施形態で説明した構成と同様である。さらに本実施形態においては、ＩＣカード１０１に格納されているＰＩＮ管理プログラム、あるいは複数のサービスプログラムは、ＩＣカード１０１内部で、互いにＡＰＤＵ形式のコマンドを送受信することが可能であるものとする。このような処理は、例えば、ＩＣカード用のオペレーティングシステムとして知られているＭＵＬＴＯＳが有する機能の１つである「デレゲーション機能」を用いることで実現できる。

【００６８】このデレゲーション機能について図８を用いて説明する。図８において、ＩＣカード１０１には、プログラムＡ６５０と、プログラムＢ６５１とが格納されている。まず、決済端末１００がプログラムＡ６５０に対して、ＡＰＤＵ形式のコマンドＡを発行すると、プログラムＡ６５０は、ＡＰＤＵ形式のコマンドＢをプログラムＢ６５１に発行して、任意の処理をプログラムＢ６５１に代行させる。次に、プログラムＢ６５１は、代行処理の結果をレスポンスＢとしてプログラムＡ６５０に返す。そして、レスポンスＢの結果を基に、プログラムＡ６５０は、決済端末１００にレスポンスＡを返す。

【００６９】以上説明したように、ＩＣカード１０１内部のあるプログラムが、ＩＣカード１０１外部からコマンドを受信すると、受信したコマンドに基づいて行なう処理の一部を、ＩＣカード１０１内部にある他のプログラムにコマンドを送信することで代行させる機能をデレゲーション機能と呼ぶ。

【００７０】本実施形態においては、上述したデレゲーション機能を用いるが、ＩＣカードのオペレーティングシステムとしては、ＭＵＬＴＯＳを用いなくても、デレゲーション機能と同等の機能を有している他のオペレーティングシステムを用いる構成であっても構わない。

【００７１】次に、本実施形態に係わる決済端末１００の処理フローを説明していく。図９は、カード所有者１０２が、ＩＣカード１０１を用いて、決済端末１００で決済処理を行なうときのフロー図である。この例では、決済端末１００がＩＣカード１０１に送信するコマンドはＡＰＤＵ形式を用いるものとする。また、ＩＣカードは、サービスプログラム１３１とＰＩＮ管理プログラム１３２を格納しており、決済端末１００は、サービスプログラム１３１に発行するコマンドの論理チャンネル番号として論理チャンネルＡを用い、ＰＩＮ管理プログラム１３２に発行するコマンドの論理チャンネル番号として論理チャンネルＢを用いて、同時に通信を行なうものとする。

【００７２】まず、ＩＣカード１０１が決済端末１００に挿入されると、ステップＳ８００としてＩＣカードの初期化処理を行なう。この処理では、決済端末１００がＩＣカード１０１にリセット要求を送信し、その後ＩＣカード１０１からリセット応答を受信するといったことが行なわれる。

【００７３】次に、決済端末１００は、ステップＳ８０１として、カード所有者１０２の選択等により、ＩＣカード１０１内に格納されているサービスプログラム１３１を選択する。この処理では、まず、決済端末１００が、ファイル選択コマンドを論理チャンネルＡを用いてＩＣカード１０１に発行することで、サービスプログラム１３１が格納されている専用ファイルを選択する。つづいて、決済端末１００が、特定のコマンドを論理チャンネルＡを用いてサービスプログラム１３１に発行していくことで、サービスプログラム１３１に基づいた処理を、ＰＩＮ認証が必要になるまで行なっていく。

【００７４】ここで、ＰＩＮ認証を実行する前に、決済端末１００は、ステップＳ８０２として、ファイル選択コマンドを論理チャンネルＢを用いてＩＣカード１０１に発行し、ＰＩＮ管理プログラム１３２が格納されている専用ファイルを選択しておく。

【００７５】次に、カード所有者１０２が共通ＰＩＮを決済端末１００に入力すると、ステップＳ８０３として、決済端末１００は、共通ＰＩＮをＩＣカード１０１に送信し、ＩＣカード１０１内部でＰＩＮ検証を行なわせる。この処理では、まず、決済端末１００は、論理チャンネルＢを用いて、ＰＩＮ検証コマンドをＰＩＮ管理プログラム１３２に発行する。ここで、ＰＩＮ検証コマンドには共通ＰＩＮと、サービスプログラム１３１に対応するアプリケーション識別子ＡＩＤが格納されるものとする。次に、ＰＩＮ管理プログラム１３２はこれらのデータを取得すると、第１の実施形態で図４を用いて説明した処理手順に従って、個別ＰＩＮを抽出する。次にＰＩＮ管理プログラム１３２は、抽出した個別ＰＩＮを格納したＰＩＮ検証コマンドをサービスプログラム１３１に発行し、サービスプログラム１３１に個別ＰＩＮの照合を行なわせ、照合結果を取得する。そして、ＰＩＮ管理プログラム１３２は、照合結果を決済端末１００に返信する。ここで、ステップＳ８０３の処理は、前述したデレゲーション機能を用いることで実現できる。

【００７６】以上説明した手順に従って、ＰＩＮ認証が終了した後、ステップＳ８０４として、端末１００は残りの決済処理を、ＩＣカード１０１に特定のコマンド発行するなどして継続していく。

【００７７】次に、第４の実施形態について説明する。まず、本実施形態に係わるＩＣカードおよび決済端末の構成を図１０に示す。図１０に示した構成は、第１の実施形態の説明で図１に示した構成と同様であるが、ＰＩＮ入力手段１１３が指紋読み取り手段１９０に置き換わった点と、カード所有者１０２が共通ＰＩＮ１０５を記憶しなくてもよい点が異なっている。

【００７８】ここで、指紋読み取り手段１９０は、カード所有者１０２の指紋を読み取り、指紋情報を抽出する機能を有する。したがって、本実施形態においては、カード所有者１０２は、ＰＩＮを決済端末１００に入力する代わりに、自分の指紋を指紋読み取り手段１９０で読み取らせることで、本人認証を行う。

【００７９】次に、本実施形態に係わるＩＣカードに格納されている情報の構成を図１１に示す。図１１に示した構成は、第１の実施形態の説明で図２に示した構成と同様であるが、ＰＩＮ管理専用ファイル１２２にＰＩＮ管理データ１４２Ａ、１４２Ｂ、１４２Ｃを格納する代わりに、ＡＩＤと個別ＰＩＮから成るデータ１４４Ａ、１４４Ｂ、１４４Ｃと、指紋情報１９１とを格納してい

る点が異なっている。ここで、データ１４４Ａを構成するＡＩＤは専用ファイル１２１Ａに対応し、個別ＰＩＮは専用ファイル１２１Ａに格納されているサービスプログラム１３１Ａにより実行されるオフラインＰＩＮ認証に用いられる。同様に、データ１４４Ｂを構成するＡＩＤは専用ファイル１２１Ｂに対応し、個別ＰＩＮはサービスプログラム１３１Ｂにより実行されるオフラインＰＩＮ認証に用いられる。また、データ１４４Ｃを構成するＡＩＤは専用ファイル１２１Ｃに対応し、個別ＰＩＮはサービスプログラム１３１Ｃにより実行されるオンラインＰＩＮ認証に用いられる。また、指紋情報１９１は、カード所有者１０２の指紋に対応した情報である。ここで、データ１４４Ａ、１４４Ｂ、１４４Ｃを外部へ読み出すことは、指紋情報１９１の照合が成功しないと出来ないようになっている。

【００８０】次に、本実施形態に係わる決済端末１００の処理フローを説明していく。図１２は、カード所有者１０２が、ＩＣカード１０１を用いて、決済端末１００で決済処理を行う時のフロー図である。図１２に示したフロー図は、第２の実施形態の説明で図７に示したフローとステップＳ７０２まで同様であるが、カード所有者１０２は、共通ＰＩＮを決済端末１００に入力する代わりに、指紋を決済端末１００に読み取らせている点が異なる。

【００８１】すなわち、ステップＳ１０００において、決済端末１００が読み取った指紋は、指紋読み取り手段により指紋情報に変換され、決済端末１００は指紋情報を、ＩＣカード１０１に送信してＩＣカード１０１から特定の個別ＰＩＮを返信してもらう。この処理では、決済端末１００は、個別ＰＩＮ取得コマンドを、ＰＩＮ管理プログラム１３２に発行する。ここで、個別ＰＩＮコマンドには、指紋情報とサービスプログラム１３１に対応するアプリケーション識別子が格納されており、ＰＩＮ管理プログラム１３２は、個別ＰＩＮコマンドを受信すると、指紋情報の照合を行い、照合が成功した場合に、指定したアプリケーション識別子に対応する個別ＰＩＮを決済端末１００に返す。決済端末１００は、この個別ＰＩＮを用いることで、第２の実施形態と同様のＰＩＮ認証を行うことが可能になる。

【００８２】以上説明したように、本実施形態においては、カード所有者１０２が、ＩＣカード１０１を用いて実行可能ないずれかのサービスを受ける場合において、サービス毎に行う必要のあるＰＩＮ認証を、指紋を決済端末１００に読み取らせるだけで、実行することが可能になる。ここで、カード所有者１０２は指紋を決済端末１００に読み取らせる代わりに共通ＰＩＮを入力し、ＩＣカード１０１には指紋情報を記録する代わりに共通ＰＩＮを記録しておき、ＩＣカード１０１内で共通ＰＩＮの照合が成功した場合に、ＩＣカードから個別ＰＩＮを読み出せる構成であっても本発明の適用範囲である。

【００８３】

【発明の効果】以上説明したように、本発明によれば、ＩＣカード所有者が、複数のサービスに対応したＩＣカードを用いて各サービスを受ける場合に、サービス毎に行なう必要のあるＰＩＮ認証を、共通のＰＩＮを一つ覚えておくだけ、あるいは指紋を読み取らせるだけで実行できる構成にすることで、ＩＣカード所有者の利便性を向上することが可能になる。

【図面の簡単な説明】

【図１】　本発明の第１の実施形態に係わるＩＣカードおよび端末の構成を示した図。

【図２】　本発明の第１の実施形態に係わるＩＣカードに格納される情報の構成を示した図。

【図３】　本発明の第１の実施形態に係わるＰＩＮ管理データの構成と生成手順を示した図。

【図４】　本発明の第１の実施形態に係わるＰＩＮ管理データの復号手順を示した図。

【図５】　本発明の第１の実施形態に係わる決済端末の処理フローを示した図。

【図６】　本発明の第２の実施形態に係わるコマンドの構成を示した図。

【図７】　本発明の第２の実施形態に係わる決済端末の処理フローを示した図。

【図８】　本発明の第３の実施形態に係わるプログラム間通信の処理フローを示した図。

【図９】　本発明の第３の実施形態に係わる決済端末の処理フローを示した図。

【図１０】　本発明の第４の実施形態に係わるＩＣカードおよび端末の構成を示した図。

【図１１】　本発明の第４の実施形態に係わるＩＣカードに格納される情報の構成を示した図。

【図１２】　本発明の第４の実施形態に係わる決済端末の処理フローを示した図。

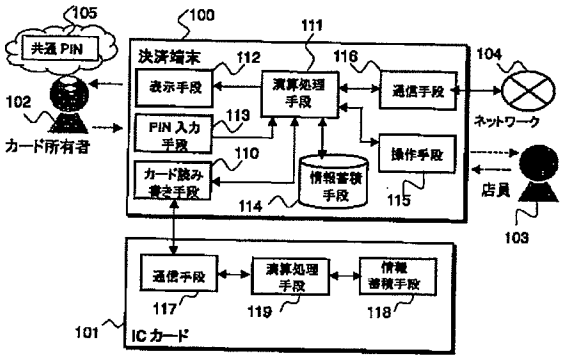
【図１３】　ＩＣカードのファイル構成を示した図。

【符号の説明】

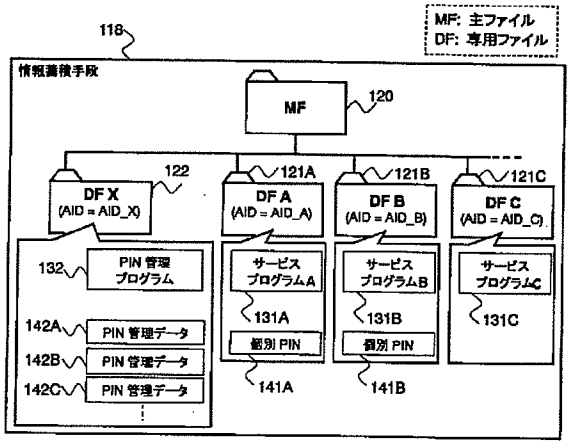
１００　決済端末
１０１　ＩＣカード
１０２　カード所有者
１０３　店員
１０４　ネットワーク
１０５　共通ＰＩＮ
１１０　カード読み書き手段
１１１　演算処理手段
１１２　表示手段
１１３　ＰＩＮ入力手段
１１４　情報蓄積手段
１１５　操作手段
１１６　通信手段
１１７　通信手段
１１８　情報蓄積手段

１１９　演算処理手段

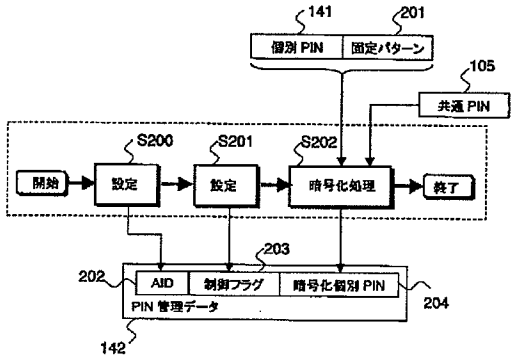
【図１】



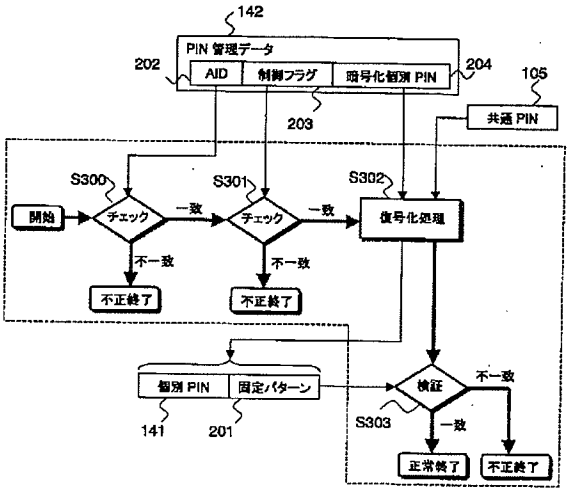
【図２】



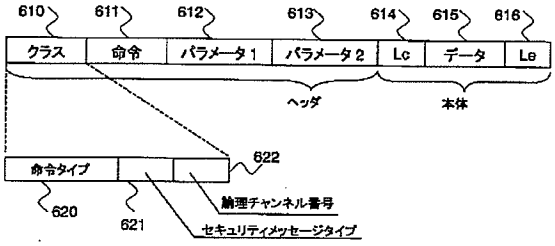
【図３】



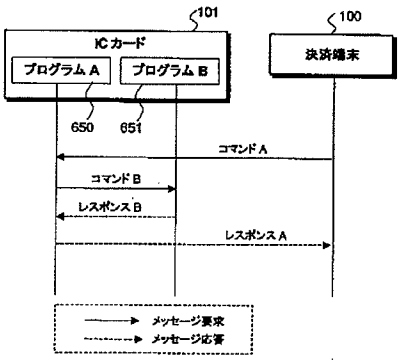
【図４】



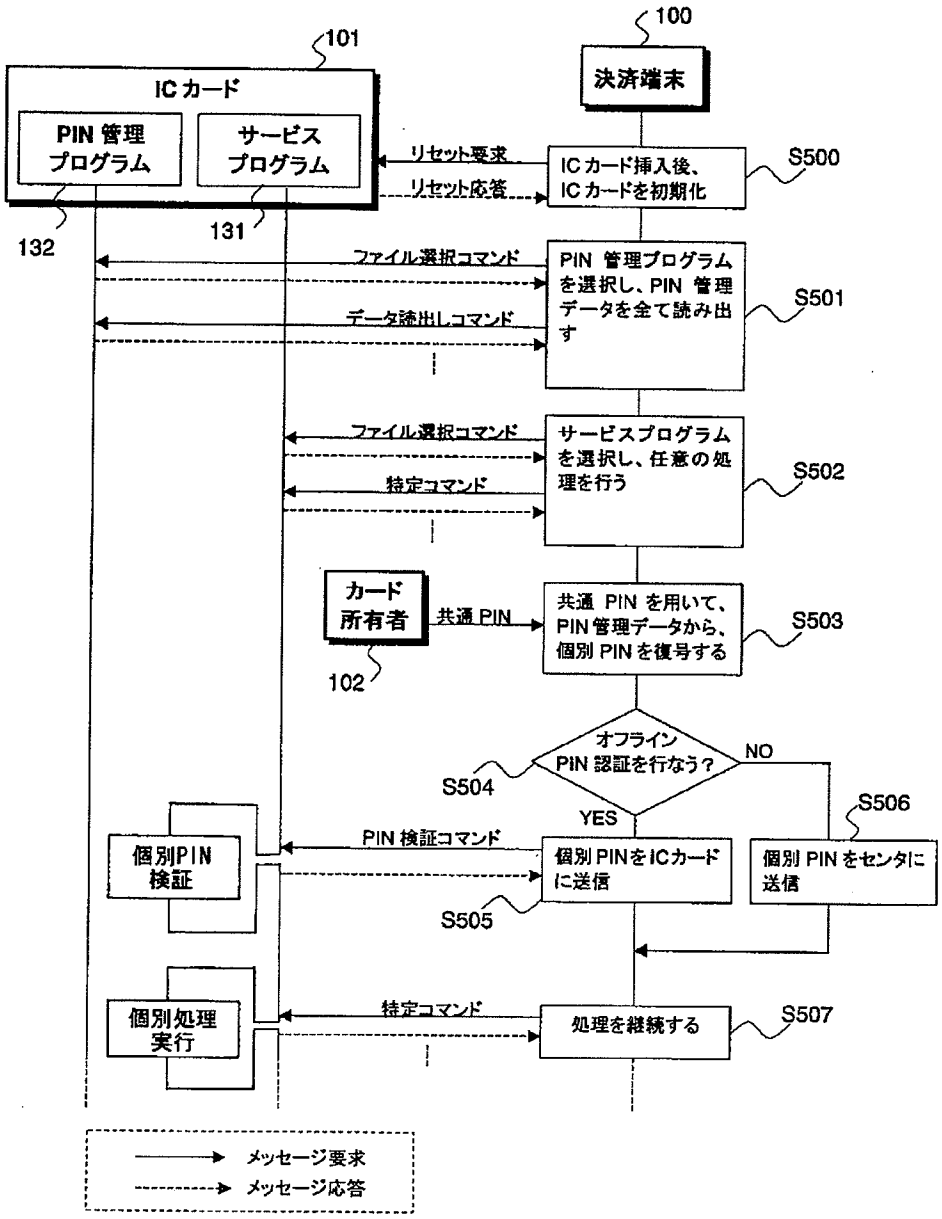
【図６】



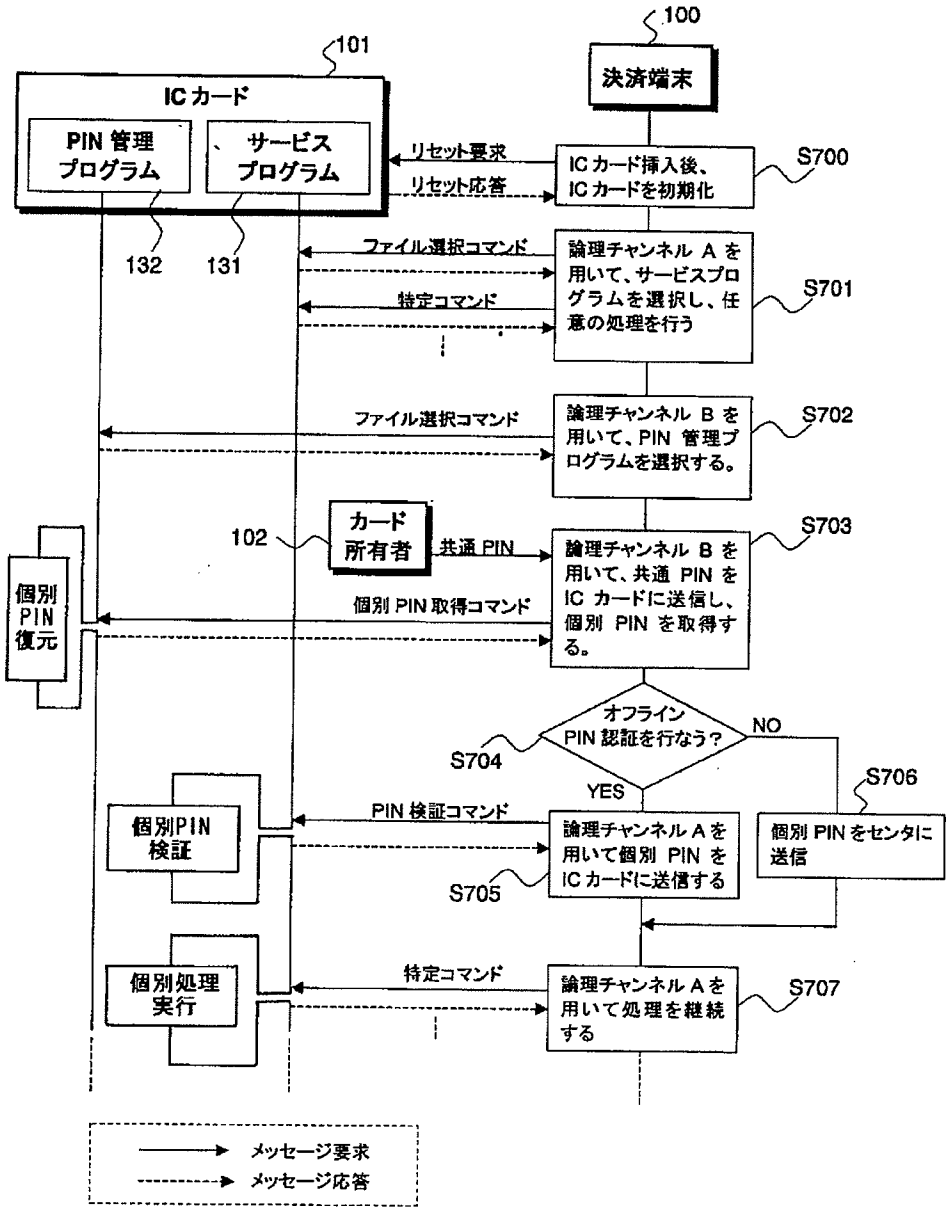
【図８】



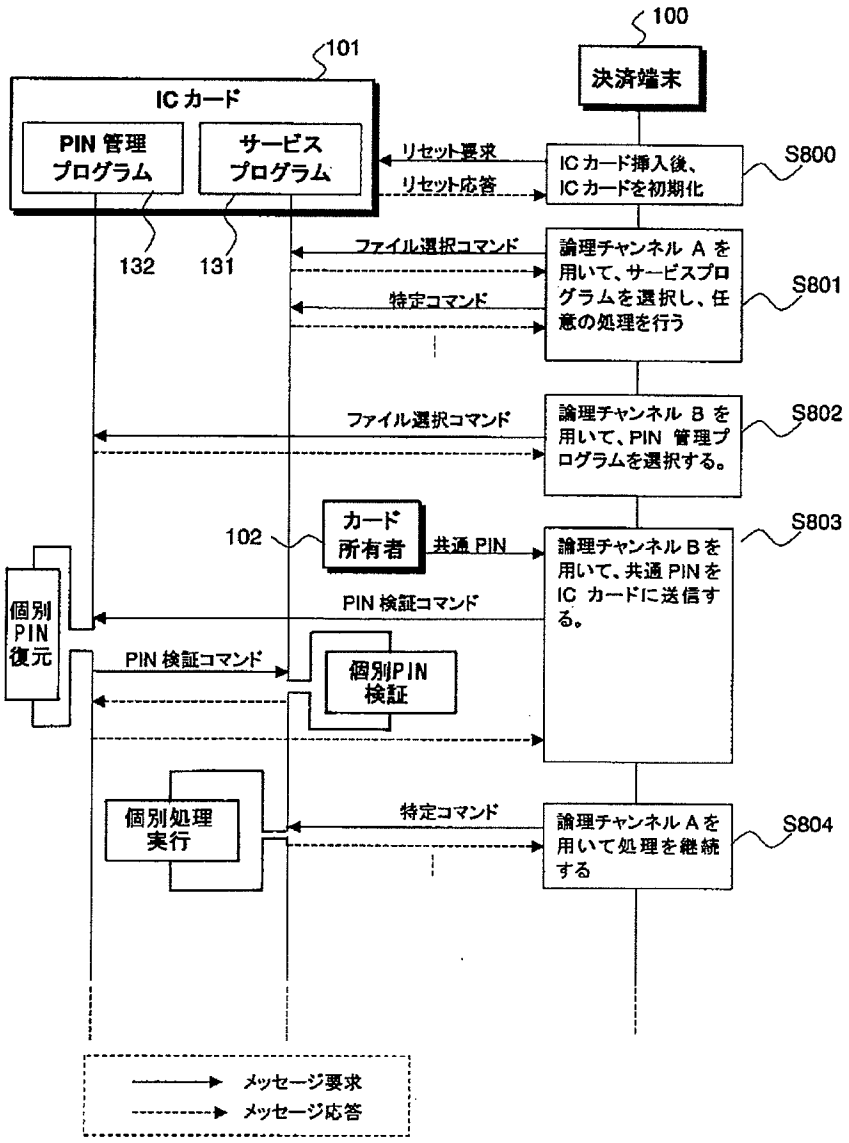
【図５】


100
決済端末
101
ICカード
PIN管理プログラム
サービスプログラム
132
131
リセット要求
リセット応答
ICカード挿入後、ICカードを初期化
S500
ファイル選択コマンド
データ読出しコマンド
PIN管理プログラムを選択し、PIN管理データを全て読み出す
S501
ファイル選択コマンド
特定コマンド
サービスプログラムを選択し、任意の処理を行う
S502
カード所有者
102
共通PIN
共通PINを用いて、PIN管理データから、個別PINを復号する
S503
オフラインPIN認証を行なう？
S504
NO
YES
S506
PIN検証コマンド
個別PIN検証
個別PINをICカードに送信
S505
個別PINをセンタに送信
個別処理実行
特定コマンド
処理を継続する
S507
メッセージ要求
メッセージ応答

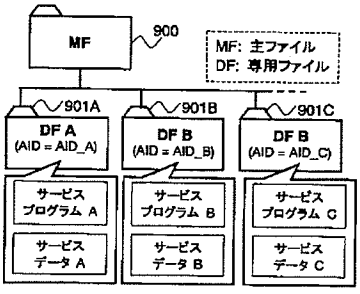
【図７】


100
決済端末
101
ICカード
PIN管理プログラム
サービスプログラム
132
131
リセット要求
リセット応答
ICカード挿入後、ICカードを初期化
S700
ファイル選択コマンド
特定コマンド
論理チャンネルAを用いて、サービスプログラムを選択し、任意の処理を行う
S701
ファイル選択コマンド
論理チャンネルBを用いて、PIN管理プログラムを選択する。
S702
102
カード所有者
共通PIN
論理チャンネルBを用いて、共通PINをICカードに送信し、個別PINを取得する。
S703
個別PIN復元
個別PIN取得コマンド
オフラインPIN認証を行なう？
NO
YES
S704
S706
個別PIN検証
PIN検証コマンド
論理チャンネルAを用いて個別PINをICカードに送信する
個別PINをセンタに送信
S705
個別処理実行
特定コマンド
論理チャンネルAを用いて処理を継続する
S707
メッセージ要求
メッセージ応答

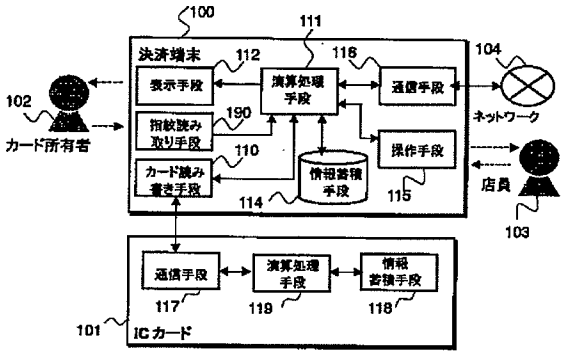
【図９】


100
決済端末
101
ICカード
PIN管理プログラム
サービスプログラム
132
131
リセット要求
リセット応答
ICカード挿入後、ICカードを初期化
S800
ファイル選択コマンド
特定コマンド
論理チャンネルAを用いて、サービスプログラムを選択し、任意の処理を行う
S801
ファイル選択コマンド
論理チャンネルBを用いて、PIN管理プログラムを選択する。
S802
102
カード所有者
共通PIN
論理チャンネルBを用いて、共通PINをICカードに送信する。
S803
個別PIN復元
PIN検証コマンド
PIN検証コマンド
個別PIN検証
個別処理実行
特定コマンド
論理チャンネルAを用いて処理を継続する
S804
メッセージ要求
メッセージ応答

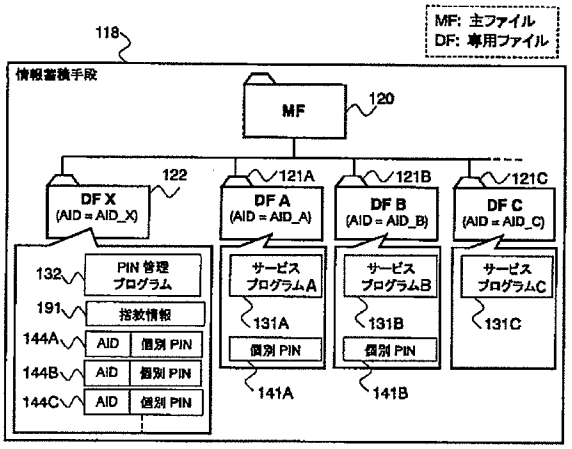
【図１３】


MF
900
MF: 主ファイル
DF: 専用ファイル
901A
901B
901C
DF A (AID = AID_A)
DF B (AID = AID_B)
DF B (AID = AID_C)
サービスプログラムA
サービスデータA
サービスプログラムB
サービスデータB
サービスプログラムC
サービスデータC

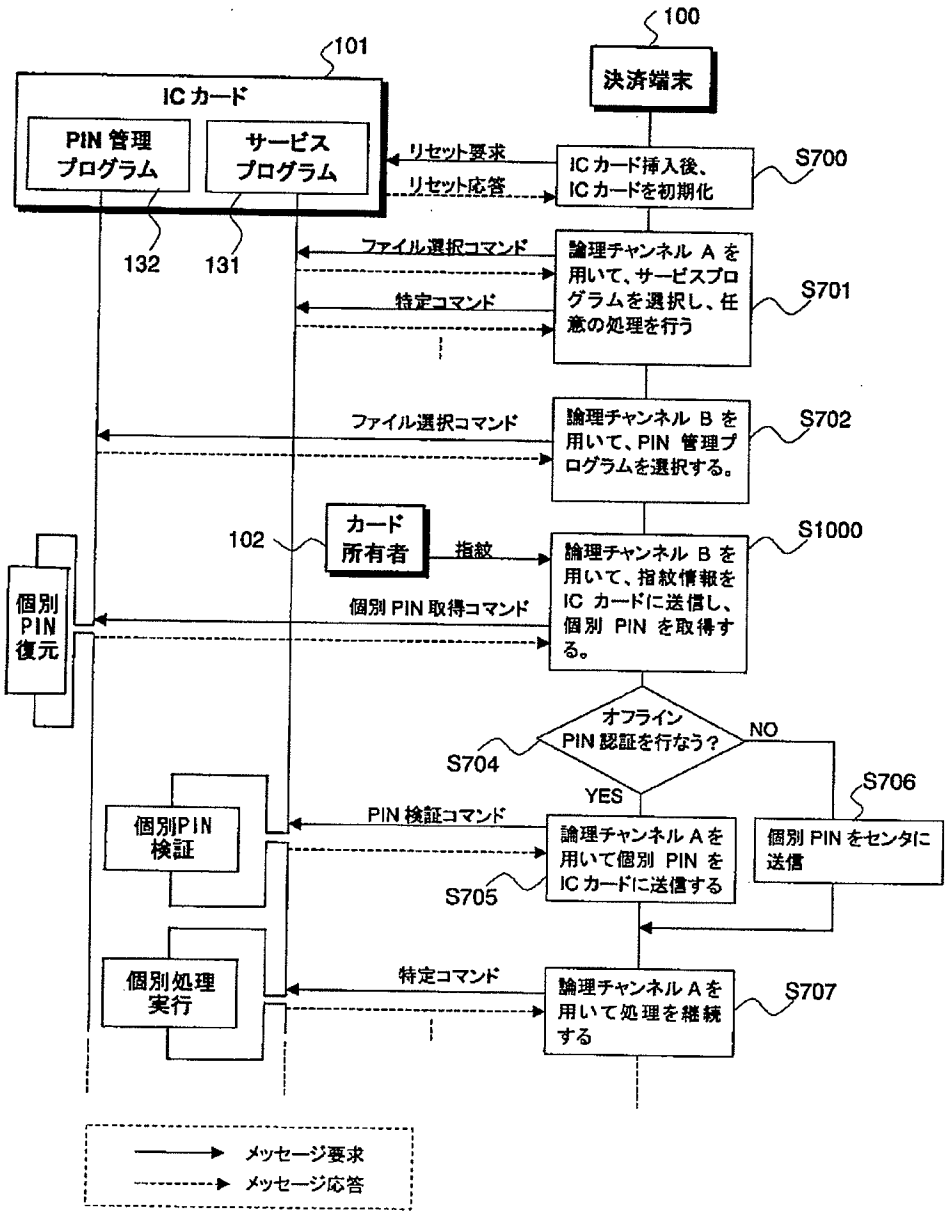
【図１０】


100
111
決済端末
112
116
104
表示手段
演算処理手段
通信手段
ネットワーク
102
190
指紋読み取り手段
操作手段
カード所有者
110
カード読み書き手段
情報蓄積手段
114
115
店員
103
通信手段
演算処理手段
情報蓄積手段
117
119
118
101
ICカード

【図１１】


MF: 主ファイル
DF: 専用ファイル
118
情報蓄積手段
MF
120
122
121A
121B
121C
DF X (AID = AID_X)
DF A (AID = AID_A)
DF B (AID = AID_B)
DF C (AID = AID_C)
132
PIN 管理プログラム
191
指紋情報
144A
144B
144C
AID
個別 PIN
サービスプログラムA
サービスプログラムB
サービスプログラムC
131A
131B
131C
141A
141B

【図１２】



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CLAIMS

[Claim(s)]

[Claim 1]A service program to process service which needs a cardholder's justification check One or more pieces, An individual password used in order to perform said cardholder's justification check One or more pieces, A password inputting means as which it is an IC card terminal using an IC card one or more encryption passwords which enciphered said individual password were remembered to be, and said cardholder can input the 1st password, A card write means which communicates with said IC card, and said encryption password are read from said IC card by said card write means, Decrypt by said 1st password and it has an arithmetic processing means which transmits the 2nd password that generated and generated the 2nd password to said IC card by said card write means, An IC card terminal characterized by carrying out normal execution of said service when said 2nd password is in agreement with said individual password inside said IC card.

[Claim 2]Establish an information accumulation means which accumulates information acquired from said IC card, and said encryption password is read from said IC card by said card write means, The IC card terminal according to claim 1 reading said encryption password which was accumulated in this information accumulation means and accumulated in this information accumulation means, and decoding by the 1st password.

[Claim 3]Said encryption password enciphers using said 1st password, and what combined fixed value data which consists of as specific a value as said individual password said arithmetic processing means, If said fixed value data corrects to data which decrypted said encryption password using said 1st password and ** is contained in it, said said 2nd password produced by decrypting, The IC card terminal according to claim 1 or 2 judging that it is equal to said individual password.

[Claim 4]A service program to process service which needs a cardholder's justification check One or more pieces, An IC card one or more encryption passwords which enciphered an individual password used in order to perform said cardholder's justification check were remembered to be is used, A password inputting means as which it is an IC card terminal which communicates with a center apparatus which is keeping said individual password, and said cardholder can input the 1st password, A card write means which communicates with said IC card, and a means of communication which communicates with said center apparatus via a network, Said encryption password read from said IC card by said card write means is decrypted by said 1st password, An IC card terminal characterized by carrying out normal execution of said service when the 2nd password is generated, it has an arithmetic processing means which transmits said 2nd password to said center apparatus by said means of communication and said 2nd password is in agreement with said individual password with said center apparatus.

[Claim 5]Establish an information accumulation means which accumulates information acquired from said IC card, and said encryption password is read from said IC card by said card write means, The IC card terminal according to claim 4 reading said encryption password which was accumulated in this information accumulation means and accumulated in this information accumulation means, and decoding by the 1st password.
[Claim 6]Said encryption password enciphers using said 1st password, and what combined fixed value data which consists of as specific a value as said individual password said arithmetic processing means, The IC card terminal according to claim 5 which will be characterized by judging that said said 2nd password produced by decrypting is equal to said individual password if said fixed value data corrects to data which decrypted said encryption password using said 1st password and ** is contained in it.
[Claim 7]A service program to process service which needs a cardholder's justification check One or more pieces, An individual password used in order to perform said cardholder's justification check One or more pieces, An IC card one or more encryption passwords which enciphered said individual password were remembered to be, the person himself/herself in a system which consists of an IC card terminal which provides said service for said cardholder using said IC card -- it being an authentication method and, A processing step to which said IC card terminal reads said encryption password from said IC card, A processing step which accumulates said encryption password which said IC card terminal read from said IC card, A processing step as which said card holder inputs the 1st password into said IC card terminal, A processing step which decrypts said encryption password which said IC card terminal is accumulating by said 1st password, and generates the 2nd password, the person himself/herself by whom a processing step which carries out normal execution of said service being included when said IC card terminal transmits said 2nd password to said IC card and said 2nd password is in agreement with said individual password inside said IC card -- an authentication method.
[Claim 8]A service program to process service characterized by comprising the following which needs a cardholder's justification check One or more pieces, An IC card one or more encryption passwords which enciphered an individual password used in order to perform said cardholder's justification check were remembered to be, the person himself/herself in a system which consists of a center apparatus which is connected with an IC card terminal which provides said service for said cardholder using said IC card, and said IC card terminal via a network, and is keeping said individual password -- an authentication method.
A processing step to which said IC card terminal reads said encryption password from said IC card.
A processing step which accumulates said encryption password which said IC card terminal read from said IC card.

A processing step as which said card holder inputs the 1st password into said IC card terminal. A processing step which decrypts said encryption password which said IC card terminal is accumulating by said 1st password, and generates the 2nd password, A processing step which carries out normal execution of said service when said IC card terminal transmits said 2nd password to said center apparatus and said 2nd password is in agreement with said individual password with said center apparatus.

[Claim 9]A service program to process service which needs a cardholder's justification check One or more pieces, An individual password used in order to perform said cardholder's justification check One or more pieces, An IC card a password control program in which an encryption password which enciphered said individual password manages one or more pieces and said encryption password was remembered to be, the person himself/herself in a system which consists of an IC card terminal which provides said service for said cardholder using said IC card -- with a processing step as which it is an authentication method and said cardholder inputs the 1st password into said IC card terminal. A processing step at which said IC card terminal transmits said 1st password to said IC card, Said password control program executed within said IC card decrypts said encryption password by said 1st password, and generates the 2nd password, A processing step which transmits to said IC card terminal, and said IC card terminal transmit said 2nd password to said IC card, the person himself/herself by whom a processing step which carries out normal execution of said service being included when said 2nd password is in agreement with said individual password inside said IC card -- an authentication method.
[Claim 10]A service program to process service which needs a cardholder's justification check One or more pieces, An individual password used in order to perform said cardholder's justification check One or more pieces, An IC card a password control program in which an encryption password which enciphered said individual password manages one or more pieces and said encryption password was remembered to be, the person himself/herself in a system which consists of an IC card terminal which provides said service for said cardholder using said IC card -- with a processing step as which it is an authentication method and said card holder inputs the 1st password into said IC card terminal. A processing step at which said IC card terminal transmits said 1st password to said IC card, A processing step which said password control program executed within said IC card decrypts said encryption password by said 1st password, and generates the 2nd password, the person himself/herself by whom a processing step which carries out normal execution of said service being included when said password program transmits the 2nd password to said service program and said 2nd password is in agreement with said individual password -- an authentication method.
[Claim 11]A service program to process service characterized by comprising the following

which needs a cardholder's justification check One or more pieces, An IC card terminal which provides said service for said cardholder using an IC card the 1st password that protects that an individual password used in order to perform said cardholder's justification check outputs one or more pieces and said individual password outside was remembered to be.
A password inputting means as which said cardholder can input the 2nd password.
A card write means which communicates with said IC card.
Transmit to said IC card by said IC card write means, and said 2nd password inside said IC card, When said 2nd password is in agreement with said 1st password, acquire said individual password by said IC card write means, and said individual password is transmitted to said IC card by said card write means, An arithmetic processing means which carries out normal execution of said service when collation of said individual password inside said IC card is successful.

[Claim 12]A service program to process service characterized by comprising the following which needs a cardholder's justification check One or more pieces, An individual password used in order to perform said cardholder's justification check One or more pieces, An IC card terminal which provides said service for said cardholder using an IC card the 1st biological information that protects outputting said individual password outside, and a control program which manages biological information were remembered to be.
A biological information reading means which can read the 2nd biological information in said cardholder.
A card write means which communicates with said IC card.
Transmit said 2nd biological information to said IC card by said IC card write means, and inside said IC card, When said 2nd biological information is in agreement with said 1st biological information, acquire said individual password by said IC card write means, and said individual password is transmitted to said IC card by said card write means, An arithmetic processing means which carries out normal execution of said service when collation of said individual password inside said IC card is successful.

[Claim 13]The IC card terminal according to claim 12, wherein a fingerprint is used for said 1st biological information and said 2nd biological information.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]an IC card is used for this invention -- the person himself/herself -- it is related with the IC card terminal equipment and the person-himself/herself authentication method which attest.

[0002]

[Description of the Prior Art]In recent years, an IC card is spreading widely instead of a magnetic card. This is because there is the feature provided with the arithmetic unit (microprocessor) for performing cipher processing with a large storage capacity, etc. which is not in a magnetic card that an inside can be observed easily and nothing is (it has the Tampa-proof nature) in an IC card. By applying an IC card with such a feature to a settlement system, an identification system, etc., security can be raised compared with a magnetic card, or the new service which was not able to be realized in a magnetic card can be provided. For example, there are electronic money and a credit card as service which a settlement system provides, and an employee ID card, a driver's license, etc. are raised as service which an identification system provides.

[0003]The IC card is classified into the contact type and the noncontact type according to the communication method.

Each specification is already standardized.

For example, a contact smart card is ISO (International Organization for Standardization: International Organization for Standardization), and is standardized as ISO/IEC7816. The IC card based on ISO/IEC7816 calculates inside according to the command which transmits from a terminal, is performing returning a result as a response one by one, and carries out processing for realizing service.

[0004]Here, the command and response which are transmitted and received between IC card terminals are specified in the form of APDU (Application Protocol Data Unit) ISO/IEC7816. The IC card based on ISO/IEC7816 is stored in the file in which a program and data had a layered structure as shown in drawing 13.

[0005]In drawing 13, the main file (MF) 900 is a file of a top layer, and exists only one in an IC card, and two or more dedicated file (DF)901A, and 901B and 901C exist in the bottom of it. Data (it is called service information below) required for the program (it is called the service program below) and service execution for performing specific service is stored in a dedicated file. Since two or more existence is possible for a dedicated file in an IC card, two or more services can be used by the IC card of one sheet by storing two or more service programs and service information in a different dedicated file.

[0006]In order to execute a specific service program, a terminal chooses first the dedicated file in which the specific service program is stored as a file of KARENTO using the "file selection command" specified as a command of APDU form. Thereby, the command which an IC card receives from a terminal after it comes to be processed according to the selected service program. Here, each dedicated file is identifiable from the outside by ID called an application identifier (it omits the following AID). For example, the "file selection command" can choose a specific dedicated file by specifying AID.
[0007]now, the case where service is received using an IC card -- a cardholder -- the attestation which it may be urged to attest that the person himself/herself is using that card, for this reason it performs -- the person himself/herself -- it is called attestation. The PIN attestation as which a cardholder inputs the password called PIN into a terminal as a method for realizing person-himself/herself attestation is common. PIN attestation includes "off-line PIN attestation" compared with PIN which has memorized PIN which the cardholder inputted in an IC card, and "on-line PIN attestation" compared with PIN in which the center holds PIN which the cardholder inputted via a network. the persons themselves himself/herself, such as PIN attestation, -- attesting is important in order to prevent the illegal use of an IC card.
[0008]
[Problem to be solved by the invention]As explained above, can use various services by the IC card of one sheet by using an IC card, but. On the other hand, in order to use each service, when performing PIN attestation, the cardholder keeps different PIN for every service in mind, and may have to use PIN properly for every service to be used. This becomes a factor which spoils a card user's convenience greatly.
[0009]Then, when this invention receives each service using an IC card corresponding to two or more services in an IC card owner, an IC card terminal which can improve an IC card owner's convenience by carrying out PIN attestation which needs to be performed for every service to composition which can be performed only by keeping one common PIN in mind, and the person himself/herself -- it aims at providing an authentication method.
[0010]
[Means for solving problem]In this invention, a service program to process service which needs a cardholder's justification check To achieve the above objects, one or more pieces, An individual password used in order to perform said cardholder's justification check One or more pieces, A password inputting means as which said cardholder can input the 1st password in an IC card terminal using an IC card one or more encryption passwords which enciphered said individual password were remembered to be, A card write means which communicates with said IC card, and an information accumulation means which accumulates information acquired from said IC card, Said encryption password is read from said IC card by said card write means, Said encryption password which was accumulated in said information accumulation

means and accumulated in said information accumulation means is read, Decrypt by said 1st password, generate the 2nd password, and said 2nd password is transmitted to said IC card by said card write means, When said 2nd password is in agreement with said individual password inside said IC card, it has an arithmetic processing means which carries out normal execution of said service.

[0011]In this invention, the service program to process the service which needs a cardholder's justification check One or more pieces, The individual password used in order to perform said cardholder's justification check One or more pieces, The IC card one or more encryption passwords which enciphered said individual password were remembered to be, the person himself/herself in the system which consists of an IC card terminal which provides said service for said cardholder using said IC card -- an authentication method with the processing step to which said IC card terminal reads said encryption password from said IC card. The processing step which accumulates said encryption password which said IC card terminal read from said IC card, The processing step as which said card holder inputs the 1st password into said IC card terminal, The processing step which decrypts said encryption password which said IC card terminal is accumulating by said 1st password, and generates the 2nd password, When said IC card terminal transmits said 2nd password to said IC card and said 2nd password is in agreement with said individual password inside said IC card, the processing step which carries out normal execution of said service is included.

[0012]Namely, in order to solve an aforementioned problem, this invention, The service program to process the service which needs a cardholder's justification check One or more pieces, The individual password used in order to perform said cardholder's justification check One or more pieces, The password inputting means as which said cardholder can input the 1st password in the IC card terminal using the IC card one or more encryption passwords which enciphered said individual password were remembered to be, The card write means which communicates with said IC card, and said encryption password are read from said IC card by said card write means, Decrypt by said 1st password and it has an arithmetic processing means which transmits the 2nd password that generated and generated the 2nd password to said IC card by said card write means, When said 2nd password was in agreement with said individual password inside said IC card, it was made to carry out normal execution of said service.

[0013]This invention establishes an information accumulation means which accumulates information acquired from said IC card in the above-mentioned IC card terminal, and reads said encryption password from said IC card by said card write means, Said encryption password which was accumulated in this information accumulation means and accumulated in this information accumulation means is read, and it was made to decode by the 1st password.

[0014]In the above-mentioned IC card terminal, this invention said encryption password,

Encipher using said 1st password and what combined said individual password and fixed value data which consists of a specific value said arithmetic processing means, When said fixed value data corrected to data which decrypted said encryption password using said 1st password and ** was contained in it, we decided to judge that said said 2nd password produced by decrypting is equal to said individual password.

[0015]In order to solve an aforementioned problem, a service program which processes service which needs a cardholder's justification check this invention One or more pieces, An IC card one or more encryption passwords which enciphered an individual password used in order to perform said cardholder's justification check were remembered to be is used, A password inputting means as which said cardholder can input the 1st password in an IC card terminal which communicates with a center apparatus which is keeping said individual password, A card write means which communicates with said IC card, and a means of communication which communicates with said center apparatus via a network, Said encryption password read from said IC card by said card write means is decrypted by said 1st password, When the 2nd password was generated, it had an arithmetic processing means which transmits said 2nd password to said center apparatus by said means of communication and said 2nd password was in agreement with said individual password with said center apparatus, we decided to carry out normal execution of said service.

[0016]This invention establishes an information accumulation means which accumulates information acquired from said IC card in the above-mentioned IC card terminal, and reads said encryption password from said IC card by said card write means, Said encryption password which was accumulated in this information accumulation means and accumulated in this information accumulation means is read, and it was made to decode by the 1st password.

[0017]In the above-mentioned IC card terminal, this invention said encryption password, Encipher using said 1st password and what combined said individual password and fixed value data which consists of a specific value said arithmetic processing means, When said fixed value data corrected to data which decrypted said encryption password using said 1st password and ** was contained in it, we decided to judge that said said 2nd password produced by decrypting is equal to said individual password.

[0018]In order to solve an aforementioned problem, a service program which processes service which needs a cardholder's justification check this invention One or more pieces, An individual password used in order to perform said cardholder's justification check One or more pieces, An IC card one or more encryption passwords which enciphered said individual password were remembered to be, the person himself/herself in a system which consists of an IC card terminal which provides said service for said cardholder using said IC card -- an authentication method with a processing step to which said IC card terminal reads said encryption password from said IC card. A processing step which accumulates said encryption

password which said IC card terminal read from said IC card, A processing step as which said card holder inputs the 1st password into said IC card terminal, A processing step which decrypts said encryption password which said IC card terminal is accumulating by said 1st password, and generates the 2nd password, When said IC card terminal transmitted said 2nd password to said IC card and said 2nd password was in agreement with said individual password inside said IC card, it was made for a processing step which carries out normal execution of said service to be included.

[0019]In order to solve an aforementioned problem, the service program which processes the service which needs a cardholder's justification check this invention One or more pieces, The IC card one or more encryption passwords which enciphered the individual password used in order to perform said cardholder's justification check were remembered to be, The IC card terminal which provides said service for said cardholder using said IC card, the person himself/herself in the system which consists of a center apparatus which is connected with said IC card terminal via the network, and is keeping said individual password -- an authentication method, The processing step to which said IC card terminal reads said encryption password from said IC card, The processing step which accumulates said encryption password which said IC card terminal read from said IC card, The processing step as which said card holder inputs the 1st password into said IC card terminal, The processing step which decrypts said encryption password which said IC card terminal is accumulating by said 1st password, and generates the 2nd password, When said IC card terminal transmits said 2nd password to said center apparatus and said 2nd password is in agreement with said individual password with said center apparatus, It was made for the processing step which carries out normal execution of said service to be included.

[0020]In order to solve an aforementioned problem, the service program which processes the service which needs a cardholder's justification check this invention One or more pieces, The individual password used in order to perform said cardholder's justification check One or more pieces, The IC card the password control program in which the encryption password which enciphered said individual password manages one or more pieces and said encryption password was remembered to be, the person himself/herself in the system which consists of an IC card terminal which provides said service for said cardholder using said IC card -- an authentication method with the processing step as which said cardholder inputs the 1st password into said IC card terminal. The processing step at which said IC card terminal transmits said 1st password to said IC card, Said password control program executed within said IC card decrypts said encryption password by said 1st password, and generates the 2nd password, It was made for the processing step which transmits to said IC card terminal, and the processing step which carries out normal execution of said service when said IC card terminal transmits said 2nd password to said IC card and said 2nd password is in agreement

with said individual password inside said IC card to be included.
[0021]In order to solve an aforementioned problem, the service program which processes the service which needs a cardholder's justification check this invention One or more pieces, The individual password used in order to perform said cardholder's justification check One or more pieces, The IC card the password control program in which the encryption password which enciphered said individual password manages one or more pieces and said encryption password was remembered to be, the person himself/herself in the system which consists of an IC card terminal which provides said service for said cardholder using said IC card -- an authentication method with the processing step as which said card holder inputs the 1st password into said IC card terminal. The processing step at which said IC card terminal transmits said 1st password to said IC card, The processing step which said password control program executed within said IC card decrypts said encryption password by said 1st password, and generates the 2nd password, When said password program transmitted the 2nd password to said service program and said 2nd password was in agreement with said individual password, it was made for the processing step which carries out normal execution of said service to be included.
[0022]This invention is provided with the following in order to solve an aforementioned problem.
A service program which processes service which needs a cardholder's justification check is one or more pieces.
An individual password used in order to perform said cardholder's justification check is one or more pieces.
A password inputting means as which said cardholder can input the 2nd password in an IC card terminal which provides for said cardholder the **** aforementioned service for IC cards the 1st password that protects outputting said individual password outside was remembered to be.
Transmit to said IC card by said IC card write means, and a card write means which communicates with said IC card, and said 2nd password inside said IC card, When said 2nd password is in agreement with said 1st password, acquire said individual password by said IC card write means, and said individual password is transmitted to said IC card by said card write means, An arithmetic processing means which carries out normal execution of said service when collation of said individual password inside said IC card is successful.

[0023]This invention is provided with the following in order to solve an aforementioned problem.
A service program which processes service which needs a cardholder's justification check is one or more pieces.

An individual password used in order to perform said cardholder's justification check is one or more pieces.
The 1st biological information that protects outputting said individual password outside.
A biological information reading means in which an IC card terminal which provides said service for said cardholder using an IC card a control program which manages biological information was remembered to be can read the 2nd biological information in said cardholder, Transmit a card write means which communicates with said IC card, and said 2nd biological information to said IC card by said IC card write means, and inside said IC card, When said 2nd biological information is in agreement with said 1st biological information, acquire said individual password by said IC card write means, and said individual password is transmitted to said IC card by said card write means, An arithmetic processing means which carries out normal execution of said service when collation of said individual password inside said IC card is successful.

[0024]In the above-mentioned IC card terminal, the fingerprint was used for this invention as said 1st biological information and said 2nd biological information.
[0025]
[Mode for carrying out the invention]Hereafter, the embodiment of this invention is described. Although following embodiments explain the case where the IC card of a contact type is used, it is not an item required for this invention that it is a contact type, for example, this invention is here, applicable even if it is a noncontact IC card. In following embodiments, although the command transmitted and received between a terminal and an IC card assumes the command of APDU form, If it is a command set which it is not an item required for this invention to use the command of APDU form, and can realize a function equivalent to APDU form, this invention is applicable no matter what thing it may use. not the item in which it is required for this invention to be such a terminal although the terminal with the function to perform the settlement of accounts for electronic money or a credit card as a terminal is assumed in following embodiments but the person himself/herself -- this invention is applicable if it is a terminal which attests.
[0026]First, a 1st embodiment is described. drawing 1 -- the person himself/herself -- the composition of the IC card and terminal concerning this embodiment which attests is shown. in drawing 1 -- the person himself/herself -- attestation is performed between the settlement system 100, IC card 101, the cardholder 102, the salesclerk 103, and the network 104. The composition shown in drawing 1 assumes that the cardholder 102 performs the settlement of accounts by electronic money or a credit card using IC card 101. Therefore, the settlement system 100 is a terminal provided with the clearing function by an IC card, for example, assumes ATM of a credit terminal or a financial institution. IC card 101 has the composition

that service of plurality, such as electronic money and a credit card, can be provided. the cardholder 102 -- the person himself/herself -- suppose that common PIN105 which can be used in common with two or more services which are PIN used for attestation and IC card 101 provides is memorized.

[0027]Next, the internal configuration of the settlement system 100 is explained. The settlement system 100 has the card write means 110, the arithmetic processing means 111, the display device 112, the PIN input means 113, the information accumulation means 114, the control means 115, and the means of communication 116.

[0028]The card write means 110 has the function to transmit a command to IC card 101 (writing), or to receive a response from an IC card (reading), in order to communicate with IC card 101.

[0029]The arithmetic processing means 111 comprises a microprocessor and a program storing memory, for example, controls the settlement system 100 whole based on the program stored in the program storing memory, and has a function which carries out settling processing.

[0030]The displaying means 112 displays the variety of information of a settlement amount etc. as opposed to the cardholder 102.

[0031]the PIN input means 113 -- the cardholder 102 -- the person himself/herself -- it has a function in which PIN for attestation can be inputted, for example using a ten key etc.

[0032]The information accumulation means 114 has a function which accumulates temporarily or permanently the information acquired from IC card 101 or the network 104, or the information which the cardholder 102 and the salesclerk 103 inputted, for example, comprises a hard disk, semiconductor memory, etc.

[0033]The control means 115 provides Interface Division for the salesclerk 103 to operate the settlement system 100, for example, comprises a keyboard, a bar code reader, a display, etc.

[0034]The means of communication 116 is used in order to have a function which communicates with a center via the network 104, for example, to perform on-line PIN attestation. Here, in the case of unmanned terminals, such as financial institution ATM, the control means 115 may not be, and, in the salesclerk 103, the settlement system 100 does not need to exist. When the settling processing by the settlement system 100 is completed off-line, there may not be the means of communication 116.

[0035]Next, the internal configuration of IC card 101 is explained. IC card 101 has the means of communication 117, the information accumulation means 118, and the arithmetic processing means 119.

[0036]The means of communication 117 communicates with the card write means 110 of the settlement system 100, and has the function to receive a command from the settlement system 100, or to reply a response to the settlement system 100.

[0037]The program and data in which the information accumulation means 118 performs service which an IC card provides, Or it has the function to store the information etc. which were acquired from the settlement system 100 temporarily or permanently, for example, comprises semiconductor memory, such as ROM (Read Only Memory), RAM (Random Access Memory), and a flash memory.
[0038]The arithmetic processing means 119 is using a microprocessor, manages control of the whole IC card and has the function to execute the program stored in the information accumulation means 118.
[0039]Next, the composition of the information stored in IC card 101 concerning this embodiment is shown in drawing 2. Drawing 2 is the file organization of information accumulation means 118 inside which constitutes IC card 101, and comprises the main file (MF) 120, dedicated file (DF)121A, 121B and 121C, and the PIN management dedicated file 122. These files have a layered structure and have the composition that the main file 120 is located in the top and the dedicated files 121A, 121B, and 121C and the PIN management dedicated file 122 are located in the lower layer. Different AID is assigned to each dedicated file and it is identifiable from the outside.
[0040]Next, an internal configuration of the dedicated files 121A, 121B, and 121C is explained. in the service program 131A which performs specific account settlement services in the dedicated file 121A, and these account settlement services -- the person himself/herself -- individual PIN141A which is data required in order to perform attestation by off-line PIN attestation is stored. The service program 131B and individual PIN141B are similarly stored in the dedicated file 121B. account settlement services which the service program 131C is stored in the dedicated file 121C, and are performed by the service program 131C -- the person himself/herself -- on-line PIN attestation shall be performed as attestation Therefore, PIN data is not stored in the dedicated file 121C.
[0041]Next, the PIN management dedicated file 122 is explained. The PIN management dedicated file 122 is a dedicated file for PIN management. The PIN control program 132 which manages individual PIN individually used for the PIN management dedicated file 122 with the service programs 131A, 131B, and 131C, The PIN management data 142A, 142B, and 142C which is data which the PIN control program 132 manages is stored. Data which needs the PIN management data 142A for off-line PIN attestation performed by the service program 131A here is contained. Similarly, data which needs the PIN management data 142B for off-line PIN attestation performed by the service program 131B is contained. Data which needs the PIN management data 142C for on-line PIN attestation performed by the service program 131C is contained.
[0042]Although three service programs are contained in the information accumulation means 118 and an PIN control program has composition of having managed three PIN management

data, in this explanation, this invention is applicable also to an IC card in which arbitrary numbers of service programs are contained. For example, when IC card 101 contains four service programs, the PIN control program should just manage four PIN management data. This invention is applicable even if it is the composition of performing off-line PIN attestation even if a service program in IC card 101 is the composition of performing on-line PIN attestation.

[0043]Next, composition and the directions for PIN management data which the PIN control program 132 concerning this embodiment has managed are explained. First, composition and a generation procedure of PIN management data are shown in drawing 3. In drawing 3, the PIN management data 142 has AID202, the control flag 203, and composition that encryption individual PIN204 is contained. AID202 is an application identifier of a dedicated file in which a service program with which the PIN management data 142 corresponds is stored. The control flag 203 shows an PIN authentic method (on-line or off-line) with which the PIN management data 142 corresponds. For example, 1 bit shall be assigned to the control flag 203 and, in the case of individual PIN for on-line in a case of "0", and "1", individual PIN for off-line shall be held at the PIN management data 142. Encryption individual PIN204 enciphers individual PIN and the contents of original individual PIN cannot be guessed only from encryption individual PIN204.

[0044]As a generation procedure of the PIN management data 142, right AID202 is first set up as Step S200. Next, the right control flag 203 is set up as Step S201. Next, encryption processing is performed by using as an encryption key common PIN105 to which the cardholder set the data which combined individual PIN141 and the fixed pattern 201 as Step S202, and the cryptogram outputted is set to encryption individual PIN204. Here, the fixed pattern 201 is a certain specific bit string, and is defined as a fixed value. It is possible to use DES which is a cryptographic algorithm based on a block cipher system, for example as encryption processing performed at Step S202. Or other encryption algorithms may be used.

[0045]The above generation procedure is performed, when registering the PIN management data 142 newly and changing common PIN105, and when changing individual PIN141. What is necessary is just to replace with old PIN management data the PIN management data generated by new common PIN, when changing common PIN. What is necessary is similarly, just to replace with old PIN management data the PIN management data generated from new individual PIN, when changing individual PIN.

[0046]Next, the procedure which extracts individual PIN from PIN management data is shown in drawing 4. This procedure is performed by using the arithmetic processing means 111 which constitutes the settlement system 100 shown in drawing 1. In drawing 4, the PIN management data 142 has AID202, the control flag 203, and the composition that encryption individual PIN204 is contained, as mentioned above.

[0047]First, it is investigated whether it is in agreement with the application identifier of the dedicated file in which the service program which checks AID202 and uses individual PIN as Step S300 is stored. If AID is not in agreement, the end of this processing of unjust is carried out. If AID is in agreement, next, as Step S301, the control flag 203 will be checked and it will be investigated whether the control flag 203, the shown PIN authentic method (off-line or on-line), and the PIN authentic method which the service program which uses individual PIN holds are in agreement. If an PIN authentic method is not in agreement, the end of the processing of unjust is carried out. When an PIN authentic method is in agreement, next, as Step S302, by using common PIN105 as an encryption key, decoding processing is performed and the plaintext outputted is divided into individual PIN141 and the fixed pattern 201. Here, as common PIN105, the cardholder 102 uses what was inputted into the terminal 100.
[0048]Next, it is verified whether the acquired fixed pattern 201 is a right value as Step S303. Here, the terminal 100 presupposes that the right value of a fixed pattern is known beforehand. If the fixed pattern 201 is not a right value, the end of this processing of unjust will be carried out. If the fixed pattern 201 is a right value, it will consider that individual PIN141 has been acquired correctly and normal termination of this processing will be carried out.
[0049]Next, the process flow of the settlement system 100 concerning this embodiment is explained. Drawing 5 is a flow chart in case the cardholder 102 performs settling processing with the settlement system 100 using IC card 101. Here, this settling processing shall be performed using the arithmetic processing means 111 which constitutes the settlement system 100 shown by drawing 1. In this example, although the IC card stores the service program 131 and the PIN control program 132, the settlement system 100 shall not communicate simultaneously with two or more programs stored in IC card 101. The command which the settlement system 100 transmits to IC card 101 is explained as what uses APDU form.
[0050]First, if IC card 101 is inserted in the settlement system 100, initialization processing of an IC card will be performed as Step S500. In this processing, the settlement system 100 transmits a reset request to IC card 101, and receiving a reset response from IC card 101 after that is performed. Next, the settlement system 100 reads all the PIN management data stored in IC card 101 as Step S501. In this processing, the settlement system 100 chooses first the PIN management dedicated file in which the PIN control program 132 is stored by publishing a file selection command to IC card 101. The PIN management data 142 is altogether read because continue and the settlement system 100 publishes a data readout command to the PIN control program 132. The read PIN management data is stored in the information accumulation means 114 shown in drawing 1.
[0051]Next, the terminal 100 chooses the service program 131 stored in IC card 101 by the cardholder's 102 selection, etc. as Step S502. In this processing, the settlement system 100 chooses first the dedicated file in which the service program 131 is stored by publishing a file

selection command to IC card 101. It continues, and by publishing a command with the specific settlement system 100 to the service program 131, processing based on the service program 131 is performed until PIN attestation is needed.

[0052]Next, the cardholder's 102 input of common PIN105 will decode individual PIN as Step S503 from PIN management data previously read from an IC card using common PIN inputted into the terminal 100. In this processing, it performs until it succeeds processing which extracts individual PIN explained using drawing 4 to all the PIN management data read from an IC card. Here, if extracting processing of individual PIN ends in failure, an operation method of interrupting settling processing will be considered first. Or if extracting processing of individual PIN goes wrong, an operation method of continuing settling processing after considering that common PIN inputted into the terminal 100 is individual PIN will also be considered. About a case of the latter, the cardholder 102 becomes an operation method in a case of inputting either common PIN or individual PIN as Step S503.

[0053]Next, it confirms whether perform PIN attestation off-line or carry out on-line as Step S504. Supposing it performs off-line PIN attestation, the settlement system 100 will transmit extracted individual PIN to IC card 101 as Step S505. The settlement system 100 is publishing an PIN verification command to the service program 131, transmits individual PIN to IC card 101, and makes individual PIN compare inside in this processing. If one side is also carried out and on-line attestation is performed, the settlement system 100 transmits extracted individual PIN to a center via a network as Step S506. After off-line PIN attestation or on-line PIN attestation is completed according to a procedure explained above, as Step S507, the terminal 100 is specific to IC card 101, carries out command issue of the remaining settling processings to it, and is continued.

[0054]Next, a 2nd embodiment is described. The composition of the IC card and settlement system concerning this embodiment is the same as the composition shown by explanation using drawing 1 by a 1st embodiment. The composition of the information stored in the IC card concerning this embodiment is the same as the composition explained using drawing 2 by a 1st embodiment. The procedure which extracts individual PIN from PIN management data is the same as the procedure explained using drawing 4 by a 1st embodiment. However, according to this embodiment, let the terminal 100 be what has possible communicating with the PIN control program stored in IC card 101, and two or more service programs simultaneously. In this embodiment, the PIN control program 132 stored in IC card 101 shall perform processing which extracts individual PIN from PIN management data.

[0055]Hereafter, a realization method of this embodiment is shown. First, drawing 6 is a block diagram of a command of APDU form. In drawing 6, a command of APUD form comprises the class 610, the command 611, the parameter 1 (612), the parameter 2 (613), Lc614, the data 615, and Le616. The class 610 is an identifier of a service program which communicates using

a command. The command 611 shows an instruction code of a command. The parameter 1 (612) and the parameter 2 (613) store a value of a parameter depending on the command 611. Lc614 expresses the length of the data 615 which is the next field. The data 615 is the field which stores data transmitted to an IC card. Le616 expresses the length of a response returned from an IC card.

[0056]In drawing 6, the class 610 comprises the command type 620, the security message type 621, and the logical channel number 622. The command type 620 is the field for classifying the command 611. A security message type is the field showing whether encryption processing for preventing tapping and an alteration of the data 615 is performed. The logical channel number 622 is used in order to distinguish the command published to the program stored in the IC card using a logical address. That is, it becomes possible by changing the value of the logical channel number 622 to communicate with two or more programs in an IC card simultaneously.

[0057]In the above explanation, although explained taking the case of the command of APDU form, if it has a function equivalent to the function using a logical channel, even if it is a command of other forms, it is applicable to this invention.

[0058]Next, the process flow of the settlement system 100 concerning this embodiment is explained. Drawing 7 is a flow chart in case the cardholder 102 performs settling processing with the settlement system 100 using IC card 101. This example explains the command which the settlement system 100 transmits to IC card 101 as what uses APDU form. The IC card stores the service program 131 and the PIN control program 132, and the settlement system 100, It shall communicate simultaneously, using logical channel B as a logical channel number of the command published to the PIN control program 132 using logical channel A as a logical channel number of the command published to the service program 131.

[0059]First, if IC card 101 is inserted in the settlement system 100, initialization processing of an IC card will be performed as Step S700. In this processing, the settlement system 100 transmits a reset request to IC card 101, and receiving a reset response from IC card 101 after that is performed.

[0060]Next, the settlement system 100 chooses the service program 131 stored in IC card 101 by the cardholder's 102 selection, etc. as Step S701. In this processing, the dedicated file in which the service program 131 is stored is first chosen by the settlement system 100 publishing a file selection command to IC card 101 using logical channel A. It continues, and by publishing a command with the specific settlement system 100 to the service program 131 using logical channel A, processing based on the service program 131 is performed until PIN attestation is needed.

[0061]Here, before performing PIN attestation, the settlement system 100 publishes a file selection command to IC card 101, using logical channel B as Step S702, and chooses the

dedicated file in which the PIN control program 132 is stored.
[0062]Next, when the cardholder 102 inputs common PIN into the settlement system 100, the settlement system 100 transmits common PIN to IC card 101, and has individual PIN replied from IC card 101 as Step S703. In this processing, the settlement system 100 publishes an individual PIN acquisition command to the PIN control program 132 using logical channel B. Here, a flag with which individual PIN corresponding to common PIN and the service program 131 to application-identifier-AID and acquire expresses an object for on-line or an object for off-line shall be stored in an individual PIN acquisition command. If these data is acquired, according to procedure explained using drawing 4 by a 1st embodiment, the PIN control program 132 will extract individual PIN, and will reply it to the settlement system 100.
[0063]Next, the settlement system 100 confirms whether perform PIN attestation off-line or carry out on-line as Step S704.
[0064]If off-line PIN attestation is performed, the settlement system 100 will transmit acquired individual PIN to IC card 101 as Step S705. The settlement system 100 is publishing an PIN verification command to the service program 131, and makes individual PIN compare by IC card 101 inside in this processing.
[0065]On the other hand, if on-line attestation is performed, the settlement system 100 transmits acquired individual PIN to a center via a network as Step S706.
[0066]After off-line PIN attestation or on-line PIN attestation is completed according to a procedure explained above, as Step S707, the terminal 100 is specific to IC card 101, carries out command issue of the remaining settling processings to it, and is continued.
[0067]Next, a 3rd embodiment is described. Composition of an IC card and a settlement system concerning this embodiment and composition of information stored in an IC card are the same as composition explained by a 2nd embodiment. Furthermore, in this embodiment, an PIN control program stored in IC card 101 or two or more service programs are IC card 101 insides, and let them be what has possible transmitting and receiving a command of APDU form mutually. Such processing is realizable by using a "delegation function" which is one of the functions which MULTOS known as an operating system for IC cards has, for example.
[0068]This delegation function is explained using drawing 8. In drawing 8, the program A650 and the program B651 are stored in IC card 101. First, when the settlement system 100 publishes the command A of APDU form to the program A650, the program A650 publishes the command B of APDU form to the program B651, and makes the program B651 execute arbitrary processings by proxy. Next, the program B651 is returned to the program A650 by making a result of vicarious execution processing into the response B. And the program A650 returns the response A to the settlement system 100 based on a result of the response B.
[0069]As explained above, if a program with IC card 101 inside receives a command from the IC card 101 exterior, The function made to execute by proxy by transmitting a command to

other programs which are in IC card 101 inside in a part of processing performed based on the received command is called a delegation function.

[0070]In this embodiment, although the delegation function mentioned above is used, it does not matter even if it is the composition using other operating systems which have a function equivalent to a delegation function as an operating system of an IC card even if it does not use MULTOS.

[0071]Next, the process flow of the settlement system 100 concerning this embodiment is explained. Drawing 9 is a flow chart in case the cardholder 102 performs settling processing with the settlement system 100 using IC card 101. In this example, the command which the settlement system 100 transmits to IC card 101 shall use APDU form. The IC card stores the service program 131 and the PIN control program 132, and the settlement system 100, It shall communicate simultaneously, using logical channel B as a logical channel number of the command published to the PIN control program 132 using logical channel A as a logical channel number of the command published to the service program 131.

[0072]First, if IC card 101 is inserted in the settlement system 100, initialization processing of an IC card will be performed as Step S800. In this processing, the settlement system 100 transmits a reset request to IC card 101, and receiving a reset response from IC card 101 after that is performed.

[0073]Next, the settlement system 100 chooses the service program 131 stored in IC card 101 by the cardholder's 102 selection, etc. as Step S801. In this processing, a dedicated file in which the service program 131 is stored is first chosen by the settlement system 100 publishing a file selection command to IC card 101 using logical channel A. It continues, and processing based on the service program 131 is performed until PIN attestation is needed, because the settlement system 100 publishes a specific command to the service program 131 using logical channel A.

[0074]Here, before performing PIN attestation, the settlement system 100 publishes a file selection command to IC card 101, using logical channel B as Step S802, and chooses a dedicated file in which the PIN control program 132 is stored.

[0075]Next, when the cardholder 102 inputs common PIN into the settlement system 100, the settlement system 100 transmits common PIN to IC card 101, and makes PIN verification perform by IC card 101 inside as Step S803. In this processing, the settlement system 100 publishes an PIN verification command to the PIN control program 132 first using logical channel B. Here, common PIN and the application identifier AID corresponding to the service program 131 shall be stored in an PIN verification command. Next, the PIN control program 132 will extract individual PIN according to procedure explained using drawing 4 by a 1st embodiment, if these data is acquired. Next, the PIN control program 132 publishes an PIN verification command which stored extracted individual PIN to the service program 131, makes

individual PIN compare with the service program 131, and acquires a matching result. And the PIN control program 132 replies a matching result to the settlement system 100. Here, processing of Step S803 is realizable by using a delegation function mentioned above.
[0076]After PIN attestation is completed according to the procedure explained above, as Step S804, the terminal 100 is specific to IC card 101, carries out command issue of the remaining settling processings to it, and is continued.
[0077]Next, a 4th embodiment is described. First, the composition of the IC card and settlement system concerning this embodiment is shown in drawing 10. Although the composition shown in drawing 10 is the same as the composition shown in drawing 1 by explanation of a 1st embodiment, the point that the PIN input means 113 replaced the fingerprint reading means 190 differs from the point that the cardholder 102 does not need to memorize common PIN105.
[0078]Here, the fingerprint reading means 190 identifies the cardholder's 102 fingerprint, and has the function to extract fingerprint information. therefore -- it is that the cardholder 102 makes his fingerprint identify by the fingerprint reading means 190 in this embodiment instead of inputting PIN into the settlement system 100 -- the person himself/herself -- it attests.
[0079]Next, the composition of the information stored in the IC card concerning this embodiment is shown in drawing 11. Although the composition shown in drawing 11 is the same as the composition shown in drawing 2 by explanation of a 1st embodiment, It differs in that AID, the data 144A, 144B, and 144C which comprises individual PIN, and the fingerprint information 191 are stored instead of storing the PIN management data 142A, 142B, and 142C in the PIN management dedicated file 122. Here, AID which constitutes the data 144A corresponds to the dedicated file 121A, and individual PIN is used for the off-line PIN attestation performed by the service program 131A stored in the dedicated file 121A. Similarly AID which constitutes the data 144B corresponds to the dedicated file 121B, and individual PIN is used for the off-line PIN attestation performed by the service program 131B. AID which constitutes the data 144C corresponds to the dedicated file 121C, and individual PIN is used for the on-line PIN attestation performed by the service program 131C. The fingerprint information 191 is information corresponding to the cardholder's 102 fingerprint. Unless collation of the fingerprint information 191 is successful, it has come to be unable to perform reading the data 144A, 144B, and 144C to the exterior here.
[0080]Next, a process flow of the settlement system 100 concerning this embodiment is explained. Drawing 12 is a flow chart in case the cardholder 102 performs settling processing with the settlement system 100 using IC card 101. Although a flow chart shown in drawing 12 is the same to a flow shown in drawing 7 by explanation of a 2nd embodiment, and Step S702, it differs in that the cardholder 102 is making the settlement system 100 identify a fingerprint instead of inputting common PIN into the settlement system 100.

[0081]That is, a fingerprint which the settlement system 100 identified is changed into fingerprint information by a fingerprint reading means, and the settlement system 100 transmits fingerprint information to IC card 101, and has specific individual PIN replied from IC card 101 in Step S1000. In this processing, the settlement system 100 publishes an individual PIN acquisition command to the PIN control program 132. An application identifier corresponding to fingerprint information and the service program 131 is stored in an individual PIN command here, and the PIN control program 132, When an individual PIN command was received, fingerprint information is compared and collation is successful, individual PIN corresponding to a specified application identifier is returned to the settlement system 100. The settlement system 100 is using this individual PIN, and it becomes possible to perform the same PIN attestation as a 2nd embodiment.

[0082]As explained above, when the cardholder 102 receives one which can be performed of services using IC card 101, in this embodiment, it becomes possible to make the settlement system 100 only identify a fingerprint, and to perform PIN attestation which needs to be performed for every service. The cardholder 102 inputs common PIN here instead of making the settlement system 100 identify a fingerprint, When common PIN is recorded and collation of common PIN is successful within IC card 101 instead of recording fingerprint information on IC card 101, even if it is the composition which can read individual PIN from an IC card, it is a scope of this invention.

[0083]

[Effect of the Invention]As explained above, when an IC card owner receives each service using the IC card corresponding to two or more services according to this invention, It becomes possible to improve an IC card owner's convenience by having composition which can be performed only by making a fingerprint identify as one common PIN is kept in mind for the PIN attestation which needs to be performed for every service.

TECHNICAL FIELD

[Field of the Invention]an IC card is used for this invention -- the person himself/herself -- it is related with the IC card terminal equipment and the person-himself/herself authentication method which attest.

PRIOR ART

[Description of the Prior Art]In recent years, an IC card is spreading widely instead of a magnetic card. This is because there is the feature provided with the arithmetic unit (microprocessor) for performing cipher processing with a large storage capacity, etc. which is not in a magnetic card that an inside can be observed easily and nothing is (it has the Tampa-proof nature) in an IC card. By applying an IC card with such a feature to a settlement system, an identification system, etc., security can be raised compared with a magnetic card, or the new service which was not able to be realized in a magnetic card can be provided. For example, there are electronic money and a credit card as service which a settlement system provides, and an employee ID card, a driver's license, etc. are raised as service which an identification system provides.

[0003]The IC card is classified into the contact type and the noncontact type according to the communication method.

Each specification is already standardized.

For example, a contact smart card is ISO (International Organization for Standardization: International Organization for Standardization), and is standardized as ISO/IEC7816. The IC card based on ISO/IEC7816 calculates inside according to the command which transmits from a terminal, is performing returning a result as a response one by one, and carries out processing for realizing service.

[0004]Here, the command and response which are transmitted and received between IC card terminals are specified in the form of APDU (Application Protocol Data Unit) ISO/IEC7816. The IC card based on ISO/IEC7816 is stored in the file in which a program and data had a layered structure as shown in drawing 13.

[0005]In drawing 13, the main file (MF) 900 is a file of a top layer, and exists only one in an IC card, and two or more dedicated file (DF)901A, and 901B and 901C exist in the bottom of it. Data (it is called service information below) required for the program (it is called the service program below) and service execution for performing specific service is stored in a dedicated file. Since two or more existence is possible for a dedicated file in an IC card, two or more services can be used by the IC card of one sheet by storing two or more service programs and service information in a different dedicated file.

[0006]In order to execute a specific service program, a terminal chooses first the dedicated file in which the specific service program is stored as a file of KARENTO using the "file selection command" specified as a command of APDU form. Thereby, the command which an IC card receives from a terminal after it comes to be processed according to the selected service program. Here, each dedicated file is identifiable from the outside by ID called an application identifier (it omits the following AID). For example, the "file selection command" can choose a

specific dedicated file by specifying AID.

[0007]now, the case where service is received using an IC card -- a cardholder -- the attestation which it may be urged to attest that the person himself/herself is using that card, for this reason it performs -- the person himself/herself -- it is called attestation. The PIN attestation as which a cardholder inputs the password called PIN into a terminal as a method for realizing person-himself/herself attestation is common. PIN attestation includes "off-line PIN attestation" compared with PIN which has memorized PIN which the cardholder inputted in an IC card, and "on-line PIN attestation" compared with PIN in which the center holds PIN which the cardholder inputted via a network. the persons themselves himself/herself, such as PIN attestation, -- attesting is important in order to prevent the illegal use of an IC card.

EFFECT OF THE INVENTION

[Effect of the Invention]As explained above, when an IC card owner receives each service using the IC card corresponding to two or more services according to this invention, It becomes possible to improve an IC card owner's convenience by having composition which can be performed only by making a fingerprint identify as one common PIN is kept in mind for the PIN attestation which needs to be performed for every service.

EFFECT OF THE INVENTION

[Effect of the Invention]As explained above, when an IC card owner receives each service using the IC card corresponding to two or more services according to this invention, It becomes possible to improve an IC card owner's convenience by having composition which can be performed only by making a fingerprint identify as one common PIN is kept in mind for the PIN attestation which needs to be performed for every service.

TECHNICAL PROBLEM

[Problem to be solved by the invention]As explained above, can use various services by an IC card of one sheet by using an IC card, but. On the other hand, in order to use each service, when performing PIN attestation, a cardholder keeps different PIN for every service in mind, and may have to use PIN properly for every service to be used. This becomes a factor which spoils a card user's convenience greatly.

[0009]Then, when this invention receives each service using an IC card corresponding to two or more services in an IC card owner, an IC card terminal which can improve an IC card owner's convenience by carrying out PIN attestation which needs to be performed for every service to composition which can be performed only by keeping one common PIN in mind, and the person himself/herself -- it aims at providing an authentication method.

MEANS

[Means for solving problem]In this invention, the service program to process the service which needs a cardholder's justification check To achieve the above objects, one or more pieces, The individual password used in order to perform said cardholder's justification check One or more pieces, The password inputting means as which said cardholder can input the 1st password in the IC card terminal using the IC card one or more encryption passwords which enciphered said individual password were remembered to be, The card write means which communicates with said IC card, and the information accumulation means which accumulates the information acquired from said IC card, Said encryption password is read from said IC card by said card write means, Said encryption password which was accumulated in said information accumulation means and accumulated in said information accumulation means is read, Decrypt by said 1st password, generate the 2nd password, and said 2nd password is transmitted to said IC card by said card write means, When said 2nd password is in agreement with said individual password inside said IC card, it has an arithmetic processing means which carries out normal execution of said service.

[0011]In this invention, a service program to process service which needs a cardholder's justification check One or more pieces, An individual password used in order to perform said cardholder's justification check One or more pieces, An IC card one or more encryption passwords which enciphered said individual password were remembered to be, the person himself/herself in a system which consists of an IC card terminal which provides said service for said cardholder using said IC card -- an authentication method with a processing step to which said IC card terminal reads said encryption password from said IC card. A processing step which accumulates said encryption password which said IC card terminal read from said IC card, A processing step as which said card holder inputs the 1st password into said IC card terminal, A processing step which decrypts said encryption password which said IC card terminal is accumulating by said 1st password, and generates the 2nd password, When said IC card terminal transmits said 2nd password to said IC card and said 2nd password is in agreement with said individual password inside said IC card, a processing step which carries out normal execution of said service is included.

[0012]Namely, in order to solve an aforementioned problem, this invention, A service program to process service which needs a cardholder's justification check One or more pieces, An individual password used in order to perform said cardholder's justification check One or more pieces, A password inputting means as which said cardholder can input the 1st password in an IC card terminal using an IC card one or more encryption passwords which enciphered said individual password were remembered to be, A card write means which communicates with said IC card, and said encryption password are read from said IC card by said card write

means, Decrypt by said 1st password and it has an arithmetic processing means which transmits the 2nd password that generated and generated the 2nd password to said IC card by said card write means, When said 2nd password was in agreement with said individual password inside said IC card, it was made to carry out normal execution of said service.
[0013]This invention establishes an information accumulation means which accumulates information acquired from said IC card in the above-mentioned IC card terminal, and reads said encryption password from said IC card by said card write means, Said encryption password which was accumulated in this information accumulation means and accumulated in this information accumulation means is read, and it was made to decode by the 1st password.
[0014]In the above-mentioned IC card terminal, this invention said encryption password, Encipher using said 1st password and what combined said individual password and fixed value data which consists of a specific value said arithmetic processing means, When said fixed value data corrected to data which decrypted said encryption password using said 1st password and ** was contained in it, we decided to judge that said said 2nd password produced by decrypting is equal to said individual password.
[0015]In order to solve an aforementioned problem, a service program which processes service which needs a cardholder's justification check this invention One or more pieces, An IC card one or more encryption passwords which enciphered an individual password used in order to perform said cardholder's justification check were remembered to be is used, A password inputting means as which said cardholder can input the 1st password in an IC card terminal which communicates with a center apparatus which is keeping said individual password, A card write means which communicates with said IC card, and a means of communication which communicates with said center apparatus via a network, Said encryption password read from said IC card by said card write means is decrypted by said 1st password, When the 2nd password was generated, it had an arithmetic processing means which transmits said 2nd password to said center apparatus by said means of communication and said 2nd password was in agreement with said individual password with said center apparatus, we decided to carry out normal execution of said service.
[0016]This invention establishes the information accumulation means which accumulates the information acquired from said IC card in the above-mentioned IC card terminal, and reads said encryption password from said IC card by said card write means, Said encryption password which was accumulated in this information accumulation means and accumulated in this information accumulation means is read, and it was made to decode by the 1st password.
[0017]In the above-mentioned IC card terminal, this invention said encryption password, Encipher using said 1st password and what combined said individual password and the fixed value data which consists of a specific value said arithmetic processing means, When said fixed value data corrected to the data which decrypted said encryption password using said 1st

password and ** was contained in it, we decided to judge that said said 2nd password produced by decrypting is equal to said individual password.

[0018]In order to solve an aforementioned problem, the service program which processes the service which needs a cardholder's justification check this invention One or more pieces, The individual password used in order to perform said cardholder's justification check One or more pieces, The IC card one or more encryption passwords which enciphered said individual password were remembered to be, the person himself/herself in the system which consists of an IC card terminal which provides said service for said cardholder using said IC card -- an authentication method with the processing step to which said IC card terminal reads said encryption password from said IC card. The processing step which accumulates said encryption password which said IC card terminal read from said IC card, The processing step as which said card holder inputs the 1st password into said IC card terminal, The processing step which decrypts said encryption password which said IC card terminal is accumulating by said 1st password, and generates the 2nd password, When said IC card terminal transmitted said 2nd password to said IC card and said 2nd password was in agreement with said individual password inside said IC card, it was made for the processing step which carries out normal execution of said service to be included.

[0019]In order to solve an aforementioned problem, the service program which processes the service which needs a cardholder's justification check this invention One or more pieces, The IC card one or more encryption passwords which enciphered the individual password used in order to perform said cardholder's justification check were remembered to be, The IC card terminal which provides said service for said cardholder using said IC card, the person himself/herself in the system which consists of a center apparatus which is connected with said IC card terminal via the network, and is keeping said individual password -- an authentication method, The processing step to which said IC card terminal reads said encryption password from said IC card, The processing step which accumulates said encryption password which said IC card terminal read from said IC card, The processing step as which said card holder inputs the 1st password into said IC card terminal, The processing step which decrypts said encryption password which said IC card terminal is accumulating by said 1st password, and generates the 2nd password, When said IC card terminal transmits said 2nd password to said center apparatus and said 2nd password is in agreement with said individual password with said center apparatus, It was made for the processing step which carries out normal execution of said service to be included.

[0020]In order to solve an aforementioned problem, a service program which processes service which needs a cardholder's justification check this invention One or more pieces, An individual password used in order to perform said cardholder's justification check One or more pieces, An IC card a password control program in which an encryption password which

enciphered said individual password manages one or more pieces and said encryption password was remembered to be, the person himself/herself in a system which consists of an IC card terminal which provides said service for said cardholder using said IC card -- an authentication method with a processing step as which said cardholder inputs the 1st password into said IC card terminal. A processing step at which said IC card terminal transmits said 1st password to said IC card, Said password control program executed within said IC card decrypts said encryption password by said 1st password, and generates the 2nd password, It was made for a processing step which transmits to said IC card terminal, and a processing step which carries out normal execution of said service when said IC card terminal transmits said 2nd password to said IC card and said 2nd password is in agreement with said individual password inside said IC card to be included.

[0021]In order to solve an aforementioned problem, a service program which processes service which needs a cardholder's justification check this invention One or more pieces, An individual password used in order to perform said cardholder's justification check One or more pieces, An IC card a password control program in which an encryption password which enciphered said individual password manages one or more pieces and said encryption password was remembered to be, the person himself/herself in a system which consists of an IC card terminal which provides said service for said cardholder using said IC card -- an authentication method with a processing step as which said card holder inputs the 1st password into said IC card terminal. A processing step at which said IC card terminal transmits said 1st password to said IC card, A processing step which said password control program executed within said IC card decrypts said encryption password by said 1st password, and generates the 2nd password, When said password program transmitted the 2nd password to said service program and said 2nd password was in agreement with said individual password, it was made for a processing step which carries out normal execution of said service to be included.

[0022]This invention is provided with the following in order to solve an aforementioned problem.

The service program which processes the service which needs a cardholder's justification check is one or more pieces.

The individual password used in order to perform said cardholder's justification check is one or more pieces.

The password inputting means as which said cardholder can input the 2nd password in the IC card terminal which provides for said cardholder the **** aforementioned service for IC cards the 1st password that protects outputting said individual password outside was remembered to be.

Transmit to said IC card by said IC card write means, and the card write means which

communicates with said IC card, and said 2nd password inside said IC card, When said 2nd password is in agreement with said 1st password, acquire said individual password by said IC card write means, and said individual password is transmitted to said IC card by said card write means, The arithmetic processing means which carries out normal execution of said service when collation of said individual password inside said IC card is successful.

[0023]This invention is provided with the following in order to solve an aforementioned problem.
The service program which processes the service which needs a cardholder's justification check is one or more pieces.
The individual password used in order to perform said cardholder's justification check is one or more pieces.
The 1st biological information that protects outputting said individual password outside.
The biological information reading means in which the IC card terminal which provides said service for said cardholder using the IC card the control program which manages biological information was remembered to be can read the 2nd biological information in said cardholder, Transmit the card write means which communicates with said IC card, and said 2nd biological information to said IC card by said IC card write means, and inside said IC card, When said 2nd biological information is in agreement with said 1st biological information, acquire said individual password by said IC card write means, and said individual password is transmitted to said IC card by said card write means, The arithmetic processing means which carries out normal execution of said service when collation of said individual password inside said IC card is successful.

[0024]In the above-mentioned IC card terminal, a fingerprint was used for this invention as said 1st biological information and said 2nd biological information.
[0025]
[Mode for carrying out the invention]Hereafter, an embodiment of this invention is described. Although following embodiments explain a case where an IC card of a contact type is used, it is not an item required for this invention that it is a contact type, for example, this invention is here, applicable even if it is a noncontact IC card. In following embodiments, although a command transmitted and received between a terminal and an IC card assumes a command of APDU form, If it is a command set which it is not an item required for this invention to use a command of APDU form, and can realize a function equivalent to APDU form, this invention is applicable no matter what thing it may use. not an item in which it is required for this invention to be such a terminal although a terminal with a function to perform settlement of accounts for electronic money or a credit card as a terminal is assumed in following embodiments but the

person himself/herself -- this invention is applicable if it is a terminal which attests.
[0026]First, a 1st embodiment is described. drawing 1 -- the person himself/herself -- composition of an IC card and a terminal concerning this embodiment which attests is shown. in drawing 1 -- the person himself/herself -- attestation is performed between the settlement system 100, IC card 101, the cardholder 102, the salesclerk 103, and the network 104. Composition shown in drawing 1 assumes that the cardholder 102 performs settlement of accounts by electronic money or a credit card using IC card 101. Therefore, the settlement system 100 is a terminal provided with a clearing function by an IC card, for example, assumes ATM of a credit terminal or a financial institution. IC card 101 has composition that service of plurality, such as electronic money and a credit card, can be provided. the cardholder 102 -- the person himself/herself -- suppose that common PIN105 which can be used in common with two or more services which are PIN used for attestation and IC card 101 provides is memorized.
[0027]Next, an internal configuration of the settlement system 100 is explained. The settlement system 100 has the card write means 110, the arithmetic processing means 111, the display device 112, the PIN input means 113, the information accumulation means 114, the control means 115, and the means of communication 116.
[0028]The card write means 110 has the function to transmit a command to IC card 101 (writing), or to receive a response from an IC card (reading), in order to communicate with IC card 101.
[0029]The arithmetic processing means 111 comprises a microprocessor and a program storing memory, for example, controls the settlement system 100 whole based on a program stored in a program storing memory, and has a function which carries out settling processing.
[0030]The displaying means 112 displays a variety of information of a settlement amount etc. as opposed to the cardholder 102.
[0031]the PIN input means 113 -- the cardholder 102 -- the person himself/herself -- it has a function in which PIN for attestation can be inputted, for example using a ten key etc.
[0032]The information accumulation means 114 has a function which accumulates temporarily or permanently information acquired from IC card 101 or the network 104, or information which the cardholder 102 and the salesclerk 103 inputted, for example, comprises a hard disk, semiconductor memory, etc.
[0033]The control means 115 provides Interface Division for the salesclerk 103 to operate the settlement system 100, for example, comprises a keyboard, a bar code reader, a display, etc.
[0034]The means of communication 116 is used in order to have a function which communicates with a center via the network 104, for example, to perform on-line PIN attestation. Here, in the case of unmanned terminals, such as financial institution ATM, the control means 115 may not be, and, in the salesclerk 103, the settlement system 100 does not

need to exist. When settling processing by the settlement system 100 is completed off-line, there may not be the means of communication 116.

[0035]Next, an internal configuration of IC card 101 is explained. IC card 101 has the means of communication 117, the information accumulation means 118, and the arithmetic processing means 119.

[0036]The means of communication 117 communicates with the card write means 110 of the settlement system 100, and has the function to receive a command from the settlement system 100, or to reply a response to the settlement system 100.

[0037]A program and data in which the information accumulation means 118 performs service which an IC card provides, Or it has the function to store information etc. which were acquired from the settlement system 100 temporarily or permanently, for example, comprises semiconductor memory, such as ROM (Read Only Memory), RAM (Random Access Memory), and a flash memory.

[0038]The arithmetic processing means 119 is using a microprocessor, manages control of the whole IC card and has the function to execute a program stored in the information accumulation means 118.

[0039]Next, composition of information stored in IC card 101 concerning this embodiment is shown in drawing 2. Drawing 2 is the file organization of information accumulation means 118 inside which constitutes IC card 101, and comprises the main file (MF) 120, dedicated file (DF) 121A, 121B and 121C, and the PIN management dedicated file 122. These files have a layered structure and have composition that the main file 120 is located in the top and the dedicated files 121A, 121B, and 121C and the PIN management dedicated file 122 are located in the lower layer. Different AID is assigned to each dedicated file and it is identifiable from the outside.

[0040]Next, an internal configuration of the dedicated files 121A, 121B, and 121C is explained. in the service program 131A which performs specific account settlement services in the dedicated file 121A, and these account settlement services -- the person himself/herself -- individual PIN141A which is data required in order to perform attestation by off-line PIN attestation is stored. The service program 131B and individual PIN141B are similarly stored in the dedicated file 121B. account settlement services which the service program 131C is stored in the dedicated file 121C, and are performed by the service program 131C -- the person himself/herself -- on-line PIN attestation shall be performed as attestation Therefore, PIN data is not stored in the dedicated file 121C.

[0041]Next, the PIN management dedicated file 122 is explained. The PIN management dedicated file 122 is a dedicated file for PIN management. The PIN control program 132 which manages individual PIN individually used for the PIN management dedicated file 122 with the service programs 131A, 131B, and 131C, The PIN management data 142A, 142B, and 142C

which is data which the PIN control program 132 manages is stored. Data which needs the PIN management data 142A for off-line PIN attestation performed by the service program 131A here is contained. Similarly, data which needs the PIN management data 142B for off-line PIN attestation performed by the service program 131B is contained. Data which needs the PIN management data 142C for on-line PIN attestation performed by the service program 131C is contained.

[0042]Although three service programs are contained in the information accumulation means 118 and the PIN control program has the composition of having managed three PIN management data, in this explanation, this invention is applicable also to the IC card in which arbitrary numbers of service programs are contained. For example, when IC card 101 contains four service programs, the PIN control program should just manage four PIN management data. This invention is applicable even if it is the composition of performing off-line PIN attestation even if the service program in IC card 101 is the composition of performing on-line PIN attestation.

[0043]Next, the composition and the directions for PIN management data which the PIN control program 132 concerning this embodiment has managed are explained. First, the composition and the generation procedure of PIN management data are shown in drawing 3. In drawing 3, the PIN management data 142 has AID202, the control flag 203, and the composition that encryption individual PIN204 is contained. AID202 is an application identifier of the dedicated file in which the service program with which the PIN management data 142 corresponds is stored. The control flag 203 shows the PIN authentic method (on-line or off-line) with which the PIN management data 142 corresponds. For example, 1 bit shall be assigned to the control flag 203 and, in the case of individual PIN for on-line in the case of "0", and "1", individual PIN for off-line shall be held at the PIN management data 142. Encryption individual PIN204 enciphers individual PIN and the contents of original individual PIN cannot be guessed only from encryption individual PIN204.

[0044]As a generation procedure of the PIN management data 142, right AID202 is first set up as Step S200. Next, the right control flag 203 is set up as Step S201. Next, encryption processing is performed by using as an encryption key common PIN105 to which the cardholder set the data which combined individual PIN141 and the fixed pattern 201 as Step S202, and the cryptogram outputted is set to encryption individual PIN204. Here, the fixed pattern 201 is a certain specific bit string, and is defined as a fixed value. It is possible to use DES which is a cryptographic algorithm based on a block cipher system, for example as encryption processing performed at Step S202. Or other encryption algorithms may be used.

[0045]The above generation procedure is performed, when registering the PIN management data 142 newly and changing common PIN105, and when changing individual PIN141. What is necessary is just to replace with old PIN management data the PIN management data

generated by new common PIN, when changing common PIN. What is necessary is similarly, just to replace with old PIN management data the PIN management data generated from new individual PIN, when changing individual PIN.

[0046]Next, procedure which extracts individual PIN from PIN management data is shown in drawing 4. This procedure is performed by using the arithmetic processing means 111 which constitutes the settlement system 100 shown in drawing 1. In drawing 4, the PIN management data 142 has AID202, the control flag 203, and composition that encryption individual PIN204 is contained, as mentioned above.

[0047]First, it is investigated whether it is in agreement with an application identifier of a dedicated file in which a service program which checks AID202 and uses individual PIN as Step S300 is stored. If AID is not in agreement, the end of this processing of unjust is carried out. If AID is in agreement, next, as Step S301, the control flag 203 will be checked and it will be investigated whether the control flag 203, a shown PIN authentic method (off-line or on-line), and an PIN authentic method which a service program which uses individual PIN holds are in agreement. If an PIN authentic method is not in agreement, the end of the processing of unjust is carried out. When an PIN authentic method is in agreement, next, as Step S302, by using common PIN105 as an encryption key, decoding processing is performed and a plaintext outputted is divided into individual PIN141 and the fixed pattern 201. Here, as common PIN105, the cardholder 102 uses what was inputted into the terminal 100.

[0048]Next, it is verified whether the acquired fixed pattern 201 is a right value as Step S303. Here, the terminal 100 presupposes that a right value of a fixed pattern is known beforehand. If the fixed pattern 201 is not a right value, the end of this processing of unjust will be carried out. If the fixed pattern 201 is a right value, it will consider that individual PIN141 has been acquired correctly and normal termination of this processing will be carried out.

[0049]Next, a process flow of the settlement system 100 concerning this embodiment is explained. Drawing 5 is a flow chart in case the cardholder 102 performs settling processing with the settlement system 100 using IC card 101. Here, this settling processing shall be performed using the arithmetic processing means 111 which constitutes the settlement system 100 shown by drawing 1. In this example, although an IC card stores the service program 131 and the PIN control program 132, the settlement system 100 shall not communicate simultaneously with two or more programs stored in IC card 101. A command which the settlement system 100 transmits to IC card 101 is explained as what uses APDU form.

[0050]First, if IC card 101 is inserted in the settlement system 100, initialization processing of an IC card will be performed as Step S500. In this processing, the settlement system 100 transmits a reset request to IC card 101, and receiving a reset response from IC card 101 after that is performed. Next, the settlement system 100 reads all the PIN management data stored in IC card 101 as Step S501. In this processing, the settlement system 100 chooses first the

PIN management dedicated file in which the PIN control program 132 is stored by publishing a file selection command to IC card 101. The PIN management data 142 is altogether read because continue and the settlement system 100 publishes a data readout command to the PIN control program 132. The read PIN management data is stored in the information accumulation means 114 shown in drawing 1.

[0051]Next, the terminal 100 chooses the service program 131 stored in IC card 101 by the cardholder's 102 selection, etc. as Step S502. In this processing, the settlement system 100 chooses first the dedicated file in which the service program 131 is stored by publishing a file selection command to IC card 101. It continues, and by publishing a command with the specific settlement system 100 to the service program 131, processing based on the service program 131 is performed until PIN attestation is needed.

[0052]Next, the cardholder's 102 input of common PIN105 will decode individual PIN as Step S503 from the PIN management data previously read from the IC card using common PIN inputted into the terminal 100. In this processing, it performs until it succeeds the processing which extracts individual PIN explained using drawing 4 to all the PIN management data read from the IC card. Here, if the extracting processing of individual PIN ends in failure, the operation method of interrupting settling processing will be considered first. Or if the extracting processing of individual PIN goes wrong, the operation method of continuing settling processing after considering that common PIN inputted into the terminal 100 is individual PIN will also be considered. About the case of the latter, the cardholder 102 becomes an operation method in the case of inputting either common PIN or individual PIN as Step S503.

[0053]Next, it confirms whether perform PIN attestation off-line or carry out on-line as Step S504. Supposing it performs off-line PIN attestation, the settlement system 100 will transmit extracted individual PIN to IC card 101 as Step S505. The settlement system 100 is publishing an PIN verification command to the service program 131, transmits individual PIN to IC card 101, and makes individual PIN compare inside in this processing. If one side is also carried out and on-line attestation is performed, the settlement system 100 transmits extracted individual PIN to a center via a network as Step S506. After off-line PIN attestation or on-line PIN attestation is completed according to the procedure explained above, as Step S507, the terminal 100 is specific to IC card 101, carries out command issue of the remaining settling processings to it, and is continued.

[0054]Next, a 2nd embodiment is described. The composition of the IC card and settlement system concerning this embodiment is the same as the composition shown by explanation using drawing 1 by a 1st embodiment. The composition of the information stored in the IC card concerning this embodiment is the same as the composition explained using drawing 2 by a 1st embodiment. The procedure which extracts individual PIN from PIN management data is the same as the procedure explained using drawing 4 by a 1st embodiment. However,

according to this embodiment, let the terminal 100 be what has possible communicating with the PIN control program stored in IC card 101, and two or more service programs simultaneously. In this embodiment, the PIN control program 132 stored in IC card 101 shall perform processing which extracts individual PIN from PIN management data.

[0055]Hereafter, the realization method of this embodiment is shown. First, drawing 6 is a block diagram of the command of APDU form. In drawing 6, the command of APUD form comprises the class 610, the command 611, the parameter 1 (612), the parameter 2 (613), Lc614, the data 615, and Le616. The class 610 is an identifier of the service program which communicates using a command. The command 611 shows the instruction code of a command. The parameter 1 (612) and the parameter 2 (613) store the value of the parameter depending on the command 611. Lc614 expresses the length of the data 615 which is the next field. The data 615 is the field which stores the data transmitted to an IC card. Le616 expresses the length of the response returned from an IC card.

[0056]In drawing 6, the class 610 comprises the command type 620, the security message type 621, and the logical channel number 622. The command type 620 is the field for classifying the command 611. A security message type is the field showing whether encryption processing for preventing tapping and an alteration of the data 615 is performed. The logical channel number 622 is used in order to distinguish a command published to a program stored in an IC card using a logical address. That is, it becomes possible by changing a value of the logical channel number 622 to communicate with two or more programs in an IC card simultaneously.

[0057]In the above explanation, although explained taking the case of a command of APDU form, if it has a function equivalent to a function using a logical channel, even if it is a command of other forms, it is applicable to this invention.

[0058]Next, a process flow of the settlement system 100 concerning this embodiment is explained. Drawing 7 is a flow chart in case the cardholder 102 performs settling processing with the settlement system 100 using IC card 101. This example explains a command which the settlement system 100 transmits to IC card 101 as what uses APDU form. An IC card stores the service program 131 and the PIN control program 132, and the settlement system 100, It shall communicate simultaneously, using logical channel B as a logical channel number of a command published to the PIN control program 132 using logical channel A as a logical channel number of a command published to the service program 131.

[0059]First, if IC card 101 is inserted in the settlement system 100, initialization processing of an IC card will be performed as Step S700. In this processing, the settlement system 100 transmits a reset request to IC card 101, and receiving a reset response from IC card 101 after that is performed.

[0060]Next, the settlement system 100 chooses the service program 131 stored in IC card 101

by the cardholder's 102 selection, etc. as Step S701. In this processing, a dedicated file in which the service program 131 is stored is first chosen by the settlement system 100 publishing a file selection command to IC card 101 using logical channel A. It continues, and by publishing a command with the specific settlement system 100 to the service program 131 using logical channel A, processing based on the service program 131 is performed until PIN attestation is needed.

[0061]Here, before performing PIN attestation, the settlement system 100 publishes a file selection command to IC card 101, using logical channel B as Step S702, and chooses a dedicated file in which the PIN control program 132 is stored.

[0062]Next, when the cardholder 102 inputs common PIN into the settlement system 100, the settlement system 100 transmits common PIN to IC card 101, and has individual PIN replied from IC card 101 as Step S703. In this processing, the settlement system 100 publishes an individual PIN acquisition command to the PIN control program 132 using logical channel B. Here, a flag with which individual PIN corresponding to common PIN and the service program 131 to application-identifier-AID and acquire expresses an object for on-line or an object for off-line shall be stored in an individual PIN acquisition command. If these data is acquired, according to procedure explained using drawing 4 by a 1st embodiment, the PIN control program 132 will extract individual PIN, and will reply it to the settlement system 100.

[0063]Next, the settlement system 100 confirms whether perform PIN attestation off-line or carry out on-line as Step S704.

[0064]If off-line PIN attestation is performed, the settlement system 100 will transmit acquired individual PIN to IC card 101 as Step S705. The settlement system 100 is publishing an PIN verification command to the service program 131, and makes individual PIN compare by IC card 101 inside in this processing.

[0065]On the other hand, if on-line attestation is performed, the settlement system 100 transmits acquired individual PIN to a center via a network as Step S706.

[0066]After off-line PIN attestation or on-line PIN attestation is completed according to the procedure explained above, as Step S707, the terminal 100 is specific to IC card 101, carries out command issue of the remaining settling processings to it, and is continued.

[0067]Next, a 3rd embodiment is described. The composition of the IC card and settlement system concerning this embodiment and the composition of the information stored in an IC card are the same as the composition explained by a 2nd embodiment. Furthermore, in this embodiment, the PIN control program stored in IC card 101 or two or more service programs are IC card 101 insides, and let them be what has possible transmitting and receiving the command of APDU form mutually. Such processing is realizable by using the "delegation function" which is one of the functions which MULTOS known as an operating system for IC cards has, for example.

[0068]This delegation function is explained using drawing 8. In drawing 8, the program A650 and the program B651 are stored in IC card 101. First, when the settlement system 100 publishes the command A of APDU form to the program A650, the program A650 publishes the command B of APDU form to the program B651, and makes the program B651 execute arbitrary processings by proxy. Next, the program B651 is returned to the program A650 by making the result of vicarious execution processing into the response B. And the program A650 returns the response A to the settlement system 100 based on the result of the response B.

[0069]As explained above, if a program with IC card 101 inside receives a command from the IC card 101 exterior, The function made to execute by proxy by transmitting a command to other programs which are in IC card 101 inside in a part of processing performed based on the received command is called a delegation function.

[0070]In this embodiment, although the delegation function mentioned above is used, it does not matter even if it is the composition using other operating systems which have a function equivalent to a delegation function as an operating system of an IC card even if it does not use MULTOS.

[0071]Next, the process flow of the settlement system 100 concerning this embodiment is explained. Drawing 9 is a flow chart in case the cardholder 102 performs settling processing with the settlement system 100 using IC card 101. In this example, the command which the settlement system 100 transmits to IC card 101 shall use APDU form. The IC card stores the service program 131 and the PIN control program 132, and the settlement system 100, It shall communicate simultaneously, using logical channel B as a logical channel number of the command published to the PIN control program 132 using logical channel A as a logical channel number of the command published to the service program 131.

[0072]First, if IC card 101 is inserted in the settlement system 100, initialization processing of an IC card will be performed as Step S800. In this processing, the settlement system 100 transmits a reset request to IC card 101, and receiving a reset response from IC card 101 after that is performed.

[0073]Next, the settlement system 100 chooses the service program 131 stored in IC card 101 by the cardholder's 102 selection, etc. as Step S801. In this processing, the dedicated file in which the service program 131 is stored is first chosen by the settlement system 100 publishing a file selection command to IC card 101 using logical channel A. It continues, and processing based on the service program 131 is performed until PIN attestation is needed, because the settlement system 100 publishes a specific command to the service program 131 using logical channel A.

[0074]Here, before performing PIN attestation, the settlement system 100 publishes a file selection command to IC card 101, using logical channel B as Step S802, and chooses the

dedicated file in which the PIN control program 132 is stored.
[0075]Next, when the cardholder 102 inputs common PIN into the settlement system 100, the settlement system 100 transmits common PIN to IC card 101, and makes PIN verification perform by IC card 101 inside as Step S803. In this processing, the settlement system 100 publishes an PIN verification command to the PIN control program 132 first using logical channel B. Here, common PIN and the application identifier AID corresponding to the service program 131 shall be stored in an PIN verification command. Next, the PIN control program 132 will extract individual PIN according to the procedure explained using drawing 4 by a 1st embodiment, if these data is acquired. Next, the PIN control program 132 publishes the PIN verification command which stored extracted individual PIN to the service program 131, makes individual PIN compare with the service program 131, and acquires a matching result. And the PIN control program 132 replies a matching result to the settlement system 100. Here, processing of Step S803 is realizable by using the delegation function mentioned above.
[0076]After PIN attestation is completed according to the procedure explained above, as Step S804, the terminal 100 is specific to IC card 101, carries out command issue of the remaining settling processings to it, and is continued.
[0077]Next, a 4th embodiment is described. First, the composition of the IC card and settlement system concerning this embodiment is shown in drawing 10. Although the composition shown in drawing 10 is the same as the composition shown in drawing 1 by explanation of a 1st embodiment, the point that the PIN input means 113 replaced the fingerprint reading means 190 differs from the point that the cardholder 102 does not need to memorize common PIN105.
[0078]Here, the fingerprint reading means 190 identifies the cardholder's 102 fingerprint, and has the function to extract fingerprint information. therefore -- it is that the cardholder 102 makes his fingerprint identify by the fingerprint reading means 190 in this embodiment instead of inputting PIN into the settlement system 100 -- the person himself/herself -- it attests.
[0079]Next, the composition of the information stored in the IC card concerning this embodiment is shown in drawing 11. Although the composition shown in drawing 11 is the same as the composition shown in drawing 2 by explanation of a 1st embodiment, It differs in that AID, the data 144A, 144B, and 144C which comprises individual PIN, and the fingerprint information 191 are stored instead of storing the PIN management data 142A, 142B, and 142C in the PIN management dedicated file 122. Here, AID which constitutes the data 144A corresponds to the dedicated file 121A, and individual PIN is used for the off-line PIN attestation performed by the service program 131A stored in the dedicated file 121A. Similarly AID which constitutes the data 144B corresponds to the dedicated file 121B, and individual PIN is used for the off-line PIN attestation performed by the service program 131B. AID which constitutes the data 144C corresponds to the dedicated file 121C, and individual PIN is used

for the on-line PIN attestation performed by the service program 131C. The fingerprint information 191 is information corresponding to the cardholder's 102 fingerprint. Unless collation of the fingerprint information 191 is successful, it has come to be unable to perform reading the data 144A, 144B, and 144C to the exterior here.

[0080]Next, a process flow of the settlement system 100 concerning this embodiment is explained. Drawing 12 is a flow chart in case the cardholder 102 performs settling processing with the settlement system 100 using IC card 101. Although a flow chart shown in drawing 12 is the same to a flow shown in drawing 7 by explanation of a 2nd embodiment, and Step S702, it differs in that the cardholder 102 is making the settlement system 100 identify a fingerprint instead of inputting common PIN into the settlement system 100.

[0081]That is, a fingerprint which the settlement system 100 identified is changed into fingerprint information by a fingerprint reading means, and the settlement system 100 transmits fingerprint information to IC card 101, and has specific individual PIN replied from IC card 101 in Step S1000. In this processing, the settlement system 100 publishes an individual PIN acquisition command to the PIN control program 132. An application identifier corresponding to fingerprint information and the service program 131 is stored in an individual PIN command here, and the PIN control program 132, When an individual PIN command was received, fingerprint information is compared and collation is successful, individual PIN corresponding to a specified application identifier is returned to the settlement system 100. The settlement system 100 is using this individual PIN, and it becomes possible to perform the same PIN attestation as a 2nd embodiment.

[0082]As explained above, when the cardholder 102 receives one which can be performed of services using IC card 101, in this embodiment, it becomes possible to make the settlement system 100 only identify a fingerprint, and to perform PIN attestation which needs to be performed for every service. The cardholder 102 inputs common PIN here instead of making the settlement system 100 identify a fingerprint, When common PIN is recorded and collation of common PIN is successful within IC card 101 instead of recording fingerprint information on IC card 101, even if it is the composition which can read individual PIN from an IC card, it is a scope of this invention.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1]The figure showing the composition of the IC card and terminal concerning a 1st embodiment of this invention.

[Drawing 2]The figure showing the composition of the information stored in the IC card concerning a 1st embodiment of this invention.

[Drawing 3]The figure showing the composition and the generation procedure of the PIN management data concerning a 1st embodiment of this invention.

[Drawing 4]The figure showing the decoding procedure of the PIN management data concerning a 1st embodiment of this invention.

[Drawing 5]The figure showing the process flow of the settlement system concerning a 1st embodiment of this invention.

[Drawing 6]The figure showing the composition of the command concerning a 2nd embodiment of this invention.

[Drawing 7]The figure showing the process flow of the settlement system concerning a 2nd embodiment of this invention.

[Drawing 8]The figure showing the process flow of the communication between programs concerning a 3rd embodiment of this invention.

[Drawing 9]The figure showing the process flow of the settlement system concerning a 3rd embodiment of this invention.

[Drawing 10]The figure showing the composition of the IC card and terminal concerning a 4th embodiment of this invention.

[Drawing 11]The figure showing the composition of the information stored in the IC card concerning a 4th embodiment of this invention.

[Drawing 12]The figure showing the process flow of the settlement system concerning a 4th embodiment of this invention.

[Drawing 13]The figure showing the file organization of an IC card.

[Explanations of letters or numerals]

100 Settlement system
101 IC card
102 Cardholder
103 Salesclerk
104 Network
105 Common PIN
110 Card write means
111 Arithmetic processing means

112 A displaying means
113 An PIN input means
114 An information accumulation means
115 A control means
116 A means of communication
117 A means of communication
118 An information accumulation means
119 An arithmetic processing means